VOLUME XVI
1936

RML
Number 61

REVIEW OF MILITARY LITERATURE

THE COMMAND AND GENERAL STAFF SCHOOL QUARTERLY

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FOREWORD

The object of this publication is a systematic review of current military literature, through cataloging articles of professional value, in selected military and naval periodicals, in the domestic and foreign field.

Articles from foreign periodicals are treated by translations of titles and digests of contents; material of particular importance is covered more extensively in a Section of "Abstracts of Foreign-language Articles."

A "Library Bulletin" Section lists books, recently accessioned, which are of particular significance.

This Review is published as a guide to modern military tendencies and to inspire vigorous thought on the subjects treated.

The opinions expressed by authors are not necessarily official.

June, 1936

Second Quarter

REVIEW OF MILITARY LITERATURE is published quarterly by The Command and General Staff School at Fort Leavenworth, Kansas. Entered as second-class matter August 31, 1934 at the Post Office at Fort Leavenworth, Kansas, under the Act of March 3, 1879. Subscription rate: One year in the U.S. and possessions, Cuba and Mexico, $1.00.

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THE COMMAND AND GENERAL STAFF SCHOOL PRESS
FORT LEAVENWORTH, KANSAS
1481—6-15-36—1700

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Section 1

ORIGINAL MILITARY STUDY

FIELD SERVICE REGULATIONS OF THE FUTURE*

By Major E. S. Johnston, Infantry

FOREWORD

I have read this article with the grestest interest from the standpoint of an older officer who feels the lack, in his own service, of an abstract, authoritative treatment of the fundamental considerations upon which depends the effective conduct of war.

This subject is receiving much attention at the Naval War College. When a work shall have been compiled which will be applicable to operations of every character, on shore, at sea, and in the air, the matter of application to the tools of the day must, it would seem, inevitably be on a more secure foundation.

The author is now a student at this College. I know him to be a sound thinker and I hope, not only that his well-considered views, as expressed herein, may give rise to profitable discussion but that, through such an interchange of intelligent opinion, the desired end may be attained, and soon.

E. C. KALBFUS,
Rear Admiral, U.S.N.,
President, Naval War College.

It is significant that the doctrine of the major armies of the world is presented substantially in the same manner in each case. Each of the greater Powers appears to issue a *basic* publication for the presentation of fundamentals, and a number of other documents which deal with *details*.

(NOTE: This article does not necessarily convey the views of this School, but is the expression of the opinions of the author.—*Editor.*)

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Our own basic doctrine is presumably contained in *Field Service Regulations*, while a number of other publications such as *Field Manuals* and *Training Regulations*, carry the discussion on into the various specialized fields.

In fact, the number of training publications in our army is very great. It is so great, indeed, that the question has often arisen among our officers whether we do not thereby defeat our purpose: whether M-day officers will be able to master so many books; whether the really essential matter is now presented in the form best suited for use. Such considerations have led one general officer to produce a very compact manual intended to contain the things really necessary as a basis for individual training of the soldier in war.

Our *Field Service Regulations* (1923, p. iii) purports to present the basic doctrine for active operations. The corresponding publications of the British, German, French, and Japanese armies have obviously the same purpose.

If we are to simplify our doctrine in order to simplify training, we should first inquire what fundamental policy should rule as to the contents of our basic doctrine manual. If there is no such policy, there should be one. And it should be correct. The character of *Field Service Regulations* determines the contents of the supplementary manuals, for otherwise the system cannot be consistent.

Our *Field Service Regulations*, 1923, was designed *for war against a modern opponent, on the assumption that this would suffice for any minor emergency* (p. iii).

Unfortunately, this theory is not correct. Braddock's defeat, our Indian wars, the British South African War, and many other examples testify to the contrary.

Our *Field Service Regulations* was designed to present doctrine applicable to *large units and to small units included therein.* The "general principles" apply to small separate units. "General principles" is a mysterious term. In practice, it means whatever it is taken to mean by individual judgment. And there can be no common doctrine in that sort of thing. The actual tendency in our army is the natural tendency; that is, to regard *Field Service Regulations* as applicable equally to all units, large or small, included or detached. For example, there was once at a service school much troubled heart-searching as to whether command areas for units smaller than a battalion could properly be indicated by boundaries; the difficulty was that *Field Service Regulations* 406 seemed

to forbid. It is inevitable that *Field Service Regulations* shall be regarded as equally applicable to all units—because it ought to be.

These two considerations establish the basic requirements of a publication like *Field Service Regulations.* It should be applicable to:

Operations of any nature
Units of every size and character.

The next question is to ask what policies should be laid down in order to conform to these requirements.

The answer is to be found in the French *Field Service Regulations* (p. 95). It was based on the policy of omitting all details "whose subsequent modification might result in rendering these *Field Service Regulations* obsolete in the near future." Such details are relegated to other more appropriate publications.

The French *Field Service Regulations* makes a conscious effort to use phraseology which will not require revision as organization, equipment, and armament change. Accordingly, it refers to "elements on foot, cyclists, mounted elements, motor vehicles," and the like. Such words as "infantry," "cavalry," and "horse-drawn artillery" are put in parentheses when used. Here and there the plain intent is forgotten (as on p. 67), but in the main it is conscientiously adhered to.

A publication based on this policy can be truly basic. And it has the additional virtue that overlapping is minimized with such specialized documents as the "Instructions for the Employment of Large Units," which corresponds to our *Manual for Commanders of Large Units.* This makes for a consistency quite lacking in our system, which is confused in the extreme. Under our policy, *Manual for Commanders of Large Units,* more recent than *Field Service Regulations,* covers much the same ground. It is necessary to read both in order to find our basic doctrine, and contradictions by one of the other are not unknown. For overlappings between the two, compare Chapter I, *Manual for Commanders of Large Units,* on the Commander and his Staff, with Chapter II, *Field Service Regulations,* on the same subject; Chapter 9, *Manual for Commanders of Large Units,* on Special Operations, with Chapter XII, *Field Service Regulations;* the cavalry-division reconnaissance discussion of *Field Service Regulations* 184 ff with *Manual for Commanders of Large Units,* Chapter 8, Section II; the discussion on the infantry division in combat,

Field Service Regulations 455 ff, with *Manual for Commanders of Large Units*, Chapter 7; the discussion as to security for the infantry division, *Field Service Regulations* 216 ff, with *Manual for Commanders of Large Units*, Chapter 7.

The logic of the French system is self-evident. It is followed by our army in other fields. For instance, we have a policy as to Joint Planning which prescribes that "the general rule is that general rather than specific terms are to be used in prescribing strengths of the various forces to be used, and matters of like nature, in order that future changes in organization and equipment may not render the plan obsolete" (A.W.C., W.P.C. No. 6-D, 1934-35). Such details are placed in annexes, which can be revised without revising the entire plan.

The same system is applicable to our training publications. A *Field Service Regulations* written on such a policy as a basis can present truly basic doctrine with rare need for revision, while the more specialized books which carry on the doctrine into particular fields may be revised as frequently as desired.

It may be argued that the French go to an extreme in using the term "foot elements" instead of infantry, and the like. But do they? Europeans realize that the means of war are undergoing a revolution. They speak nowadays, not so much of the infantry division, as of the *division;* not so much of the cavalry division, as of the light division or the *mobile* division.

Who knows what the future may bring forth? Our *Field Service Regulations* of 1914 was almost devoid of discussion of aviation (see pars. 22-26, 30), which, two years later, was already one of the great combatant arms. Similarly, the discussion of machine guns (134) was hopelessly antiquated by 1915.

Our Chemical Warfare Service is now technically a "service," but it has already been referred to by our highest military authority as "both a fighting arm and a research and procurement service" (MacArthur: Hearings). Is there much doubt that it will emerge from the next great war as a combatant arm?

Who can predict what the terminology of the future will be, and whether the designations of our oldest "arms" will remain as at present?

A basic doctrine should be presented in basic terms. And as no one can predict all the changes with certainty, the logical procedure is to express the doctrine of *Field Service Regulations* in terms that will *never* change. Any "straddle" in this matter would involve those who re-write *Field Service Regulations* in a complicated series of decisions as to what may or may not change in the near future or later, and as to what particular terminology may or may not change. Simplicity and accuracy alike indicate that the wisest policy is *to avoid the use of any terms*—whether designations of present arms, weapons, units, or what not—*which may conceivably ever change*. And "infantry" would be no exception to that rule.

Our present *Field Service Regulations*, whatever the intent, was not actually written with a basic viewpoint, but rather to meet the needs of 1923. So, in a few years, much of it became inadequate. Its discussion of cavalry (79 ff) says nothing of mechanized elements. Pursuit aviation is not now, if it ever was, "the most vital element" of air force (108). The "machine rifle" (85), the balloon "company" (114), and the tank "group" (57-62) no longer apply as in 1923. The near future may see an infantry battalion very different from the old one. Some day the regimental "company equipped with infantry cannon" (54) may become a brigade unit; or, it may become a battalion unit, as has been suggested in the past and is now the case in the Fleet Marine Force. The entire division is due for thorough revision of organization.

Moreover, there appear in *Field Service Regulations*, 1923, a number of subjects not appropriate to the basic publication on our doctrine of war. The details of troop movement (Chapter IX), shelter (Chapter X), and technique of orders and reports (Chapter III and Appendices I and III) are more appropriate to the *Staff Officers' Field Manual*, Part One. The details as to supply (F.S.R., Part II) are more suitable to *Manual for Commanders of Large Units* (Volume II) and *Staff Officers' Field Manual*, Part One.

And the logic of this criticism is shown by the progressive tendency to transfer these subjects to the specialized manuals. *Even prior to 1923*, the tendency had started; details of organization which appeared in *Field Service Regulations*, 1913 (Article 1) are now published in separate Tables of Organization and in *Staff Officers' Field Manual*, Part Three. Since the date of publication of the present *Field Service Regulations*,

the process has gone on, by driblets. Distances between march units (F.S.R. 295) have since been included in *Staff Officers' Field Manual*, Part Three. Staff functioning, technique of orders, and the use of the estimate of the situation, all appearing in *Field Service Regulations*, have since been discussed anew in *Staff Officers' Field Manual*, Part One. The employment of large units, which forms no little part of *Field Service Regulations*, is now assigned specifically to *Manual for Commanders of Large Units*, Volume I. And the details of supply, evacuation, and replacement, also appearing in *Field Service Regulations*, Part II, are dealt with anew in *Manual for Commanders of Large Units*, Volume II.

The present *Field Service Regulations*, so far as it treats of the division and the cavalry division of 1923—and these form a large part of its content—bids fair to be as obsolete in the next war as *Field Service Regulations*, 1914, was in the last one. Does any junior officer of a combat arm of 1917 recall consulting his *Field Service Regulations* in France? If so, he was an exception. Nor was this surprising; on the contrary, it was natural. *Field Service Regulations*, 1914, did not meet the needs of 1917-18. It had been written for an army of 1913, and was not in fact, as it purported to be, a basic discussion of our doctrine of war.

Aside from that portion of *Field Service Regulations* which deals specifically with our army as organized in 1923, to what extent will the doctrine presented in that publication meet the needs of the future? Let us seek out the statements of fundamental doctrine in the book, and test them. If they meet the tests, the *Field Service Regulations* can be revised by dropping out extraneous matter. If they do not, a more sweeping revision is in order.

* * * * * * *

A doctrine of war must deal fundamentally with employment of combat power; its purpose should be to show how to employ it effectively. War consists, fundamentally, of so moving protected combat power, from objective to objective, under control, as to obtain the best effect. Let us see what *Field Service Regulations* has to say as to the selection of *objectives*, the determination of *movements*, the correct application of *intensity* of combat power, the proper measures for *security*, and the appropriate methods of *control*.

The Objective

"The ultimate objective of all military operations is the destruction of the enemy's armed forces by battle" (F.S.R. 378).

This means that the destruction of the enemy's armed forces by battle is the ultimate *object*, or purpose, and that the enemy's armed forces are the ultimate *objective*—the physical thing at which combat power is ultimately aimed.

This doctrine is often attributed to Clausewitz. He did, in fact, as much as say this (Clausewitz I, 284-5), but he also unsaid it. His reasoned view was that the ultimate object of war is to accomplish a political aim (I, 11, 13) by the necessary reduction of the enemy's will to resist. By destruction of the enemy's armed forces he meant "the reduction of the enemy's military power to such a state as not to be able to prosecute the war" (I, 29). He shows that the "disarming of the enemy is rarely attained in practice" (I, 29), and that "the complete destruction of the enemy is not essential in every case" (I, 35); in fact, in many cases the object may be accomplished by a limited expenditure of force or by a mere threat (I, 13, 31, 35, 38, 41-42). "The political object will be the standard both for the aim of the military forces and also for the amount of effort to be made" (I, 11).

This paints quite a different picture. The contrast stands out in Clausewitz at his worst and at his best. At his worst he says in effect that the aim is always to seek out and fight the enemy mass, deciding the issue in one great battle (I, 2 ff, 27, 39 ff, 86, 208, 284 ff); at his best he states that *the soldier exists to fight at the right time and place* (I, 37).

Foch, at the Ecole de Guerre, captivated by the view (Clausewitz at his worst, I 86) that "strategy is the theory of the use of combats for the object of the war," taught that the object is always to seek battle to destroy the enemy main forces (Foch: Principles, 42, 45) and that "there is no longer any strategy to be compared with the strategy which aims at tactical results, at victory by battle" (43; see also vi, 34, 42, 45, 48). As late as the First Battle of Ypres he was still simplifying war into a matter of banging away at the enemy: "Frappez! Frappez!" Later, he recanted. (Seely: Adventure, 199 ff.)

The French General Staff became even more hypnotized by this over-simplified doctrine, and proclaimed prior to the

World War the "offensive a outrance," the "offensive au bout," which in substance was a theory that success must follow headlong attack. This doctrine nearly ruined the French army—also the Austrian—in 1914, and was denounced by Joffre (who had let it be nursed under his wing) and also by Foch. [Recouly 86 ff; Lucas 153; Muller (Joffre's aide) 42, 60 ff; Maurice 119; Spears 38; Seely: Adventure, 199 ff; Churchill, 159 ff; Journal Officiel etc 29 Mars 1920; Foch: Memoirs, preface.]

Our own expectations of the offensive are at present very optimistic (Stilwell, 437-438). Our officers only too often sum up everything by "when in doubt, attack." One might properly expect a careful discussion of the relative values of attack and defense in *Field Service Regulations*, but what we do find explains in no small degree the existing notions in our army.

"Decisive results are obtained only by the offensive. Only through offensive action can a commander exercise his initiative and impose his will on the enemy. A defensive attitude is never deliberately adopted except as a temporary expedient or for the purpose of economizing forces on a front where the decision is not sought in order to concentrate superior forces at the point of defensive action." (F.S.R., 380.)

This is quite generally interpreted among our people to mean "never defend if by attack you have a reasonable chance of success." During the World War the idea that success was somehow dependent on offensive action—no matter what the mission might be—caused needless loss by reason of unnecessary counterattacks launched by our smaller units. Poorly-prepared, hasty, headlong attacks, suffering fearful loss, were characteristic of our general practice of 1918. (*Review of Military Literature*, C. & G.S.S., December, 1934, 19 ff; Clark.)

The offensive and defensive are merely *methods*, each to be used in conjunction with the other according to the circumstances of the moment. Clausewitz shows (I, 16) that their values vary at different epochs; the defense was relatively very strong in the eighteenth century, until a shift of the pendulum a few years before the Napoleonic era (I, 267) gave the attacker a better chance of success. Even Napoleon regarded "the great secret" of "offensive warfare in the open field" as consisting in "defensive combat, and obliging the enemy to attack" (Burnod XIV). Hood, at Atlanta, was

kind enough to oblige Sherman in this manner. The World War showed that the defensive was again growing stronger. It is stronger than ever today unless mechanization has the contrary effect.

The ideal method of action nowadays, when conditions permit it, would appear to be the active defense, if the enemy will be good enough to exhaust himself in attack so that the counteroffensive will have the least trouble in dealing with him. Our own army, inoculated with the idea that there is some vague but triumphant virtue in "the principle of the offensive" would be just the sort of enemy to play into the hands of those, like the French (who have learned their lesson), who take a more balanced view of things.

We would do well to con the bitter denunciations which have appeared since the World War of the offensive methods employed by the British [Seely: Adventure 229; Seton Hutchison, 200 ff; Ballard 266; Journey's End (the whole play)]; and the no less bitter criticisms of their own methods by the French (Recouly 86; Foch: Memoirs, preface). Thus Foch speaks of their 1914 doctrine as "leading too often to tactics that were blind and brutal and for that very reason dangerous" and as producing "a strategy that was bare and uniform, unproductive of results, and costly."—"I always used to say," he averred in his old age (Bugnet 262), "that one did not fight for the sake of fighting, but to produce results." To be sure, he had said this very thing—here and there (Principles 291, 322). But how many times had he reiterated (Principles 34, 42, 45, 48, 282) the substance of the preface of his first book (Principles, vi) that "Battle is the only art that matters in war—Battle: Battle for victory."

The things that happened to the British, French, and to us in the World War, happened because of lack of a balanced doctrine. The easy assumption that "everyone understands these things"—that the doctrine is clear enough as it stands —is hardly borne out by significant indications. Only a few years ago, long years after the great war, one of our eminent schools was including, by a sort of convention, in reconnaissance instructions for large units, the sentence, "Raids will be executed upon the entire front of each division at least twice daily." Those who know by experience the troublous detail necessary for successful raids against an enemy in position, under actual conditions as we last saw them, can hardly agree that the relative values of attack and defense are well

understood in an army where that easy, assured order could be written—even in a school. What is done in peace at schools will be done in war at headquarters.

The *Field Service Regulations* should tell us plainly that the ultimate *object* in war is *to reduce the enemy will* to the level necessary for us to gain the end for which the war, the campaign, every littlest operation, is fought. The enemy armed forces are important only to the extent that they intervene between us and that end. When they intervene, as we must expect they may, they present a variety of *objectives.*

The particular *objective*—the physical thing at which combat power is aimed—may be one of the elements of the enemy armed forces, or it may be an element of the enemy population or resources (Interparliamentary Union: Bratt & Sergel 78; von Metzch 31, 52); it may be a hostile force, a locality, an assemblage of supplies. It may be fixed or moving. Which objective are we to choose? And remember that the *Field Service Regulations* should answer this in a manner useful *not only to the high command but to the junior leader.*

The theory that the objective is the enemy's main forces is of course at variance with the other theory that the decisive effort is to be made against hostile weakness. Both theories were well exemplified by the World-War controversies over "side-shows." Lloyd George was told by his Chief of Staff that "the first rule of all wars is to concentrate in the main theater all the force than can be supplied," and that "any departure from this rule has invariably proved disastrous." But other no less distinguished soldiers held different views—naturally. And the Prime Minister himself remembered the great envelopment by which the American Civil War had been won: a maneuver wherein the *main* Union forces fixed the *main* Confererate forces in the East, the *main theater,* while Sherman, with relatively *small* forces, swinging through the *decisive* theater, the West and the deep South, brought the war to an end. (Lloyd George IV 530.) In fact, the effect of Sherman's operations was such that no great final decisive battle in the East was necessary to decide the issue.

The Dardanelles campaign left a lasting weakness on Turkey, and was several times very near a success which would have shortened the World War. Failure was in the main due to mismanagement at home. The real error was, not in attempting to gain a decision with relatively small forces in a theater far from the enemy main forces, but in

trying to gain decisions *simultaneously in Gallipoli and in Flanders, when the means available were only adequate for the effort against the Dardanelles.* (British Official History, Dardanelles, I vi ff, 9, 354; II 63 ff, 380, 479 ff. Maurice, 81.) Many a similar "side-show" in the past had achieved decisions for Great Britain (Richmond 54, 155, 283).

A favorite rule of Jomini (II, 448), of Clausewitz at his worst (I, 284-5), and of Foch in his earlier years (Principles, 47, 54, 142, 294) was of one great mass advancing against a single objective to decide the issue in one great battle. The idea still has its advocates (Maurice, 126), although it was exploded by Sherman. He had a canny system of threatening two or more objectives, thus putting the enemy "on the horns of a dilemma" and causing him to uncover one or more objectives in the effort to protect others, or to disperse his effort unduly. (Liddell Hart 290, 379, 383, 428.)

What are the things, then, that really determine correct objects and objectives? Clausewitz says that the correct object is determined by the *means* (I, 27), the *circumstances* which attend their application—such as location, time, weather, and ground (I, 11), and the *consequences of failure* (III, 83). He says that correct *objectives* are determined by the *object* and by the other factors cited (I, 27).

Take an example. Jackson desired to deprive McClellan, in the Peninsula, of the services of McDowell; this was the *effect desired.* To do this, he wished to threaten Washington; this was his *object.* To do this, he had to deal with Banks; this was also an object, nearer in time. To deal with Banks, he had to dispose of Milroy, Fremont's advance guard. This was his immediate object. Jackson's *means* were inadequate for dealing with both simultaneously. In fact, he did not wish to suffer severe loss in his fight with Milroy, for the *consequence of even partial failure* might wreck the campaign. So he attacked Milroy, and shook him; then forebore to pursue till next day, inducing Milroy to withdraw. Then he followed him far enough to make sure that distance, burned woods, and trees felled over the roads (the *characteristics of the theater*) prevented Milroy from intervening in the projected fight with Banks (Henderson, I 301 ff).

The upshot was that Jackson accomplished the effect desired, taking as successive objectives, now a hostile force, now a terrain feature, now supplies. He made it possible for Lee to defeat McClellan; such was the effect of a blow struck,

not in the main theater, but at a distance; not by a large force, but, at the crisis, by a small detachment of 3000 bayonets (Henderson, I 249).

These, then, are the factors which determine the correct *object:* the *effect desired*, the *means available and opposed*, the *characteristics of the theater*, and the *consequences of failure.*

In like manner, the factors which determine the correct *objective* are the *object*, relative *means*, the *characteristics of the theater*, and the *consequences of failure.*

No matter what the character of the objective, whether armed forces, enemy population, or resources, whether something moving or something fixed, it is always at some *location in space.* And the aim should be so to place one's own means with reference to that objective as *to get the desired effect with the least expenditure* (Pakenham-Walsh, 127; Maurice 52; Encyclopedia Britannica: strategy; Liddell Hart, 428.)

These are the simple but fundamental things that *Field Service Regulations* should tell us about objectives—things which will remain true in spite of changes in organization, equipment, and armament.

It should point out the values of single, double, or multiple objectives. It should warn against acceptance of faulty rules. It should present the facts in terms applicable to ground, sea, and air forces; for the history of our country is a history of joint operations.

With this background the *Field Service Regulations* can leave the officer to find applications throughout history and in every act of contemporary life. For the influence of the factors is no less discernible in small things than in great, in peace than in war. The student can trace them in the historic struggles of great houses like that of Hapsburg and Savoy, or in his own difficulties with his tiny personal budget and his household problems. The fact that correct objects and objectives are determined by these factors is one of those simple, correct, sweeping generalizations which are true of *any activity on any scale.* History records, and daily observation will show, the constant effort of varieties of men to use this fact in solving every variety of problem. It is not, of course, always done consciously; nor is it always done with a clear idea on the part of the man of what he is doing. For the correct mental process is often obscured or even balked by the intervention of other, equally simple, but *faulty*, rules

which it should be the business of a presentation of basic doctrine to dispose of and to replace with reliable truth.

Movement

An intriguing characteristic of *Field Service Regulations* is the adeptness with which *it conceals fundamentals in a mass of detail.* Thus a student searching for the basic and inward significance of movement, will find it, *not prominently stated early in the book,* but treated incidentally in a discussion of the characteristics of infantry: "Through movement, infantry increases the destructive power inherent in its fire, by gaining such a position relative to the enemy as will permit of the development of a fire-power superior to that of the enemy . . ." (F.S.R. 48).

But this is true not of infantry alone, but of all elements: of armies, air forces, and fleets (Fiske, 366).

This is the point made in the discussion of objectives: that the objective is always at some location in space, and that *our aim should be,* not necessarily to seek a fight, but *to seek such a location with reference to the objective as to gain the desired objective with the least loss* (Pakenham-Walsh, 127; Encyclopedia Britannica: strategy).

A wise commander does not seek to fight if his object can be accomplished by maneuver alone (Pakenham-Walsh, 127). "I regard my two moves from Atlanta to Savannah, and Savannah to Goldsborough as as great blows as if we had fought a dozen unsuccessful battles" (Sherman, in Liddell Hart: Sherman, 379).

The student will find it written that there is some virtue in activity for its own sake; that inactivity is the cardinal sin (Foch: Principles, 45, 284). But it is more true that there are times when *the correct action is inactivity* (Chief of Infantry). There was a time when the boxer kept constantly on the move; nowadays he is supposed to husband his energy and make every move count.

Movement is merely *change of position.* It is not the movement which is fundamentally significant; it is the *position.*

In the mind of a good commander the march of his force is not conceived as an even flow, but *as a series of movements from one objective to another* (Wilkinson: Defense of Piedmont, 147). Therefore all movement is essentially movement by bounds; whether the bounds are delimited by pauses at the various objectives depends upon circumstances.

A few years ago turmoil arose at one of our schools over the "advance by bounds" as contemplated in French doctrine for the march of large forces. It was regarded as something new, to be approached with caution. But the reaction of the class was interesting, for they proved to have already a rich background in this subject by reason of our own doctrine. The students pointed out that this method was already well established in our army for small and large forces, from a pair of scouts to very large cavalry forces on reconnaissance and (especially) counter-reconnaissance. The use of the method with an infantry division was merely an application to another special case, which was hardly to be regarded as something new. But the interesting thing is that it had been so regarded; and why? Because the subject was discussed in our authoritative doctrine not under one basic heading such as *movement* or *position* where no one could fail to find it; but incidentally under reconnaissance (F.S.R., 180, 186) and elsewhere (as M.C.L.U., 22).

What are the factors, then, which actually determine movement?

First, of course, the *object*. Then the *objective*, which implies a direction (Pakenham-Walsh, 125). Then again the characteristics of the *means of action* (Foch: Principles, 39) and, of course, the characteristics of the *theater* (F.S.R., iii). The influence of the *consequences of failure* may not be so obvious; but it has been, and may often be, determining.

For instance, in Europe of the eighteenth century, states were normally poverty-stricken, armament and transport expensive, weapons intricate, training methods poorly developed, roads almost nonexistent, fortresses strong and time-consuming to reduce. Thus the defender could readily avoid battle, because the attacker took long to deploy. But battles, once joined, were murderous, and the defeated often lost artillery and train, so that he was long in recovering. And armies were hard to replace. Consequently, the results of failure were so crippling that commanders rightfully sought every means of increasing the chances of success before engaging. (Interparliamentary Union: Bratt & Sergel, 80; Scammel, 27, 257; Wilkinson: Defense of Piedmont, 68 ff.)

By Napoleon's time good roads, increased wealth, availability of man-power, simplified weapons, better training—all these had changed conditions so that the attacker had better chances of success (Clausewitz, 267; Scammel, 27, 217).

Since that time, as we noted in discussion of offensive and defensive combat under "the objective," the balance has swung back in favor of the defender again, owing to the development of automatic arms.

The inquiring soldier may ask himself whether mechanization will not swing the pendulum back again to the advantage of the attacker. But if he remembers Clausewitz' remark that armies of the eighteenth century *were much like fleets* (I, 231), and if he studies the influence of all the factors, perhaps he will not be so sure.

Fleets, like armies of the eighteenth century, are still difficult to replace owing to expense and time. Their battles, like land battles of that old era, are short and violent. The results, if both sides stick it out, are likely to leave one side relatively very strong, the other ruined. But mobility and fortified bases afford means of escape. Coastal fortications and land-based aviation may provide for fleets of today secure refuges much like the land fortresses of old.

Now, mechanized land forces will in these respects much resemble fleets, so that it may be that the pendulum is swinging back still farther in the direction of defense. In that case it may be wise for soldiers of our era to study armies of the eighteenth century and navies of today.

Intensity

Physicists say that the characteristics of a physical force are location, direction, and magnitude (Ferry, 6; Pullen, 30). This is equally true of a military force. Its direction implies an objective. Its position may involve movement. Its magnitude is the *intensity* of its combat power.

This intensity is not, of course, a matter of numbers alone, but of every factor as to fire, shock, movement, vulnerability, signal communication, morale, and training (Maurice, 21, 113, 125; MacArthur, 198; Interparliamentary Union: Delaisi, 180 ff, 195; Requin, 11; Foch, 45). As Henderson says, Providence is on the side of the big brains as well as of the big battalions (Henderson, I 409). Intensity of combat power "absorbs in modern warfare all the physical and moral forces of the country" (Foch, 45).

The word "mass" is often used with this meaning (Foch, 45), but just as often it implies the greater part of a force (Foch, 47). And this confusion leads, as will be shown, to the mistaken idea that the proper distribution of intensity of

combat power always involves building up at one point an overpowering concentration.

"Superiority" is also a poor term to convey the idea of the proper distribution of intensity, because it is a one-sided term; it emphasizes only one aspect, not both, of the concept. Terms like superiority and inferiority, concentration and dispersion, do not convey a *balanced idea* unless used together.

The result of constant emphasis on superiority and concentration has been to create a sort of horror among us of "dispersion," as if it were necessarily wrong. But obviously a certain dispersion is unavoidable and even desirable.

All infantrymen, at least, should appreciate the dangers of over-concentration. Our Navy does; the Naval War College applies a penalty for over-concentration of fire. *An excess of power can be as damaging as a deficiency* (Ency. Brit.: strategy). Who has not heard of a security detachment, if too strong, becoming unnecessarily involved in combat?

Clausewitz (I, 214) cites as a horrible example of over-concentration Napoleon's invasion of Russia in that it narrowed to a single road. However this may be, Napoleon was no advocate of concentration for its own sake. On the contrary, he was much given to far-flung formations (Vachée 17). By his re-emphasized precept "tenir son armée re-unie," he meant, *not to keep the force together in a single mass,* but to spread it out in such a way that it could at any moment be brought together for attack or defense (Wilkinson: Defense of Piedmont, 158, and Rise of General Bonaparte, 149).

In any particular situation *the correct concentration and the correct dispersion merge into identity; this merging represents* the *correct distribution* of intensity of combat power.

The distorted idea that correct distribution always involves great concentration at some point, while of course older than *Field Service Regulations,* is embedded—unfortunately—in that book. "Troops are distributed with reference to the axis of attack into two principal elements: a main or decisive attack in which the greatest offensive power is concentrated to bring about a decision; and a secondary or holding attack designed to contain the enemy, to force him to commit his reserves on the threatened front, and to prevent him from reinforcing the front attacked by the troops of the decision" (F.S.R., 434).

But this is *only one method.* It may also be correct to use the greater part of the force to contain the enemy, or to use substantially equal portions for each purpose, or to

seek a decision in more than one locality, interspersing decisive attacks with containing action (Callwell, 140).

The choice between penetration and envelopment is also presented by *Field Service Regulations* in a partial manner: that is, *all* the factors influencing the choice are not stated. It is said to be dependent (F.S.R., 435-436) on comparative means and on the approaches to the objective. But, as indicated by our instruction in the estimate of the situation (Abbreviated Form for the Estimate, C. & G.S.S.), the object and the probable consequences of failure influence this decision, as well as all others.

The question as to the proper allotment of forces applies as well to defense as to attack. And in defense, also, the real question is, how much force to allot to fixing, and how much to the decision. The defense may also act by fixing the enemy with part of the force, and by maneuvering with the remainder. Both in attack and defense the question therefore arises, how far one may separate the forces told off for these functions.

At this point there usually appears that ancient adage, "Never separate your forces," of which Admiral Fiske has pointed out that *it does not and cannot mean what it says and is easily misinterpreted* (Fiske, 293). Some military men attempt to answer the question with "Never separate your forces beyond supporting distance." The next question, then, always is, what *is* supporting distance? The *Field Service Regulations* (438) warns against the danger of defeat in detail. Very well, how is the danger to be assessed? The *Field Service Regulations* (435) also warns against double envelopments unless one has "a considerable superiority of force." This leads to a sort of blind horror of double envelopments—a horror which may sometime cost us splendid opportunities. The real question is, of course, how are we to determine whether we have adequate force for the purpose?

A few years ago the wide envelopment—by infantry—now almost a commonplace in our schools, was abhorred equally with the double envelopment. Then a reconsideration of the factors involved led to the conclusion that the defensive power of infantry is nowadays such that even a comparatively small force may maintain itself on the front of contact while a wide movement is made by the mass. As a result, we now see infantry divisions moving on a wide front, in numerous columns, prepared to initiate such a maneuver, whereas a

few years ago it was a "principle" that the infantry division rarely marched in more than three columns.

On the other hand, the presence of even comparatively small mechanized forces may shift these values back again, and render such maneuvers very risky.

The point is that there are certain factors, of fundamental character though of changing values, which actually determine these matters. Napoleon gave his view when he said, "The distances permitted between corps of an army on the march" (or between elements of any unit, for that matter) "must be governed by the localities, by the circumstances, and by the object in view" (Burnod XIII).

There is a similar common-sense view of the matter in *Field Service Regulations;* but, as is so often the case in that book, *it is not stated in a conspicuous place in a discussion of the whole matter of distribution of intensity,* but is inserted, with unintentional but effective camouflage, in a discussion of frontages. "The frontage assigned any unit varies with the mission of the unit, the terrain, the amount of artillery support available, and the extent to which the flanks are protected by natural cover or by other troops" (F.S.R., 395). Rephrase this to say, "The allotment of forces for any purpose varies with" these factors, and we have a statement which, while incomplete, contains the germ of the answer.

The truth is that the proper distribution of intensity of combat power varies with all the factors in the situation: namely, the *object,* comparative *means,* the characteristics of the *theater,* and the *probable consequences of failure.* When one has said that, he has expressed everything that can be said on the subject except to add detail and illustration.

But it sometimes happens that adequate force is not available for the desired purpose. What is to be done then? Two things may be done.

One is, as the Chief of Infantry has said: since one cannot adjust the means to the end, *to adjust the end to the means.* That is, one sets a less ambitious object.

Another thing that may be done is, to retain the same final object, but to attain it by *a series of successive efforts* by all or most of the available means against intermediate objectives, which, in the end, add up to the total effect desired.

This method is very old. During the World War it was revived by the French. It was used, on the recommendation of the French liaison officer, by our 1st Division in the Meuse-

Argonne. The French still apply it in their system of "shouldering" whereby they conquer successive "slices" of the terrain which, added up, total the final accomplishment desired.

Another example of adjusting ends to means and means to ends is shown in the holding attack. Our *Field Service Regulations* (439) represents it as moving in on a broad front with shallow depth. But this, again, is *only one method.* Another, by no means new but recently rediscovered, is to send it in in depth with a real punch on a narrow front. Meanwhile, on the remainder of the secondary front, the enemy is contained by demonstrations or local attacks; on some parts of the front the attacker may merely defend in place, and on some he may even execute defensive delaying action.

Strangely enough, these various methods do not receive a *balanced emphasis* in *Field Service Regulations,* which even goes so far as to say that "an enveloping attack will ordinarily be successful only when accompanied by a frontal attack sufficiently vigorous to force the enemy to commit a large part of his forces to the frontal defense" (435). But whether this will be true in the particular case is entirely dependent on the factors which have been discussed above (see Callwell, 140 ff). Even one factor, as of movement, vulnerability, training, morale, or signal communication, may make a vital difference today as compared to yesterday.

Similarly, pushing through hostile weakness is often the best method of attack; but it is only *one method. Field Service Regulations* notes (399) that considerations relative to the objective may make it necessary or desirable to attack strength. But the other factors which we have noted are no less influential. Consequently, when we are stopped in the effort to take a certain objective, it is wrong to reason either (1) that we ought to adhere to that objective, or (2) on the other hand that we ought to give it up and try another. Either method may be right, or wrong. Therefore a sound doctrine points out the advantages and disadvantages of both, and shows that the one to choose in any situation is the one indicated by a study of all the factors already noted.

The defense is confronted with the same problem as to enemy strength or weakness. It has two basic methods of action: one to meet strength with strength; the other, to present weakness in contact with strength, lead the attacker on, and then deal with him when he is at a disadvantage.

No discussion of problems of intensity is complete without indications of the methods of reducing relative hostile strength. One is to reduce enemy strength by diversions, propaganda, or other moral means such as surprise. The other is to reduce it relatively, by systematically adding to our own. (See Freeman, II, 16, 34, as to Lee and Johnston in early 1862.) Our own strength can be increased, without reinforcement, by systematic measures to increase mobility (Clausewitz, III, 27), add to security, and improve control. Since circumstances do not always permit time to take such measures, it must also be pointed out (F.S.R., 440) that time may put a premium on rapidity at the expense of method.

These various methods of action are fundamental, applying not only to war, but to all human problems. Therefore they should be discussed fundamentally in *Field Service Regulations:* that is, not incidentally to discussion of details of operation, but early in the book and prior to the treatment of particular operations; and not in fragmentary form so that careful research is required to find them, but *in one balanced discussion of the fundamentals of war.*

SECURITY

Security is simply *protection.* It is the opposite of vulnerability. These are two aspects of a fundamental characteristic of combat power, for which the Navy has the fine expression, "Life."

Life is the ability to endure, to take punishment, to withstand the wasting effects of climate, weather, disease, fatigue, hostile fire, or any other damaging factor. In our army, we have often made use of the similar term "battle life" with reference to units or even individuals. For instance, in the World War the battle life of a second lieutenant was sometimes said to be six weeks.

The sole purpose of security is *to conserve the life of combat power.*

The real problem as to security is to determine the proper security measures in any particular situation. These measures are determined by the factors already discussed.

For example, the *object* determines such measures. *Field Service Regulations* (210) tells us that reconnaissance and security forces operate according to different "principles" because the former may be directed on distant objectives while the latter may be bound locally to elements to be pro-

tected. But the truth is that these and all other forces operate in accordance with the demands of—among other factors—their object.

It is a common-place that security measures are influenced by *relative strength* and by the *theater* (F.S.R., 216, 252).

The influence of the *consequences of failure* is no less a factor. It is illustrated when we intensify security measures in proportion to the serious results which may follow surprise. On the other hand, there are times when we may take very risky action because even disaster may pay dividends. Thus Henderson (I, 367) believed that a bolder commander than Fremont would have attacked with all his power against Jackson at Cross Keys on June 8, 1862. For Washington was now secure, other Federal forces were closing on Jackson, and a defeat of Fremont, far from being an irreparable disaster, would, if the effort temporarily paralyzed Jackson, have been scarcely less valuable than a victory.

Reconnaissance is a phase of security operations, since its purpose is to obtain information necessary to gain that minimum level of security without which a force cannot act at all.

Here, as for other like subjects, the *Field Service Regulations* should discuss *life* and *security* in basic terms applicable to all situations and to all forces. It should point out that security measures are determined by the factors which govern all the operations of war. It should show the offensive and defensive measures of fundamental character whereby security is to be obtained. It should omit all references to the strength of security detachments in terms of fractions of the entire command, and should show, as Foch does (Principles, 153), that the composition of such a detachment, as for every other decision with regard to security, is determined by its *object*, the *strength available*, the *strength opposed*, the *conditions of the theater*, and the *consequences of failure*.

Control

Admiral Fiske states as an indispensable characteristic of combat power that it must be capable of being controlled (Fiske, 57).

Control is simply *regulation*. It includes everything relating to physical and moral stability—maintaining our own, and upsetting the enemy's.

Its importance is this: that we may not be able to exert much influence on other factors, but we can, of our own will, establish the best possible control system.

The purpose of control is *unity of effort.* The power exerted by any element of combat power is determined by the degree of unity among the efforts of its parts (Fiske, 366).

This is the bed-rock of fact. But *Field Service Regulations* presents quite another view of the matter; it tells us (F.S.R., 17) that "unity of command is essential to success."

But it isn't.

Wellington and Blucher succeeded by reason of cooperation; they had no unified command (Wilkinson: The French Army etc., 11 ff).

The Prussian armies of 1870 were commanded by a committee composed of Moltke and his heads of staff sections, who, with equal powers, cooperated effectively by reason of a common training and doctrine (Vachée, 304 ff).

An interesting fact as to joint operations in our Civil War is that results were worse under unity of command than when the army and navy commanders exercised no command over each other, but had the will to cooperate (comment of Navy instructor, A.W.C.). This has also been the British experience, as a result of which they definitely repudiate unity of command in joint operations (Corbett, 36).

Of this entire question a committee at the Army War College reported in 1935 (A.W.C., C.W.C. No. 16-A, 1934-35): "The selection of two qualified commanders who have the will to help each other to the utmost is of greater importance than the method of command, whether unity of command, cooperation, or paramount interest."

Unity of command, then, is merely a *method* of obtaining unity of effort; cooperation is another method.

Unity of command is by no means *always* preferable; the joint operations of the Civil War are one example. Others will be cited below. But even if unity of command were always the best method, *it cannot be obtained everywhere.* For instance, there are vertical cleavages in any command system—cleavages because of which no immediate unity of command exists over certain adjacent units. There are also horizontal cleavages in the command system: cleavages which require decisions as to who shall command the supporting auxiliaries.

The real problem is where to provide for unity of command and where to depend on cooperation.

Field Service Regulations attempts to answer this by saying that "all troops assigned to the execution of a distinct task must be placed under one command" (par. 17). But this does not tell us how to determine the distinct tasks, *which is the real question.*

The problem has two aspects: the determination of *vertical* divisions of responsibility in terms of space; and the determination of *horizontal* divisions of responsibility as to the command of supporting auxiliaries.

Not many years ago our infantry regarded the attack of a hill as a distinct task; we had a rule, "never split a tactical locality," which we interpreted to mean, "never split a hill." Then the question arose, what *is* a tactical locality? Investigation then showed that, from the attacker's point of view, a hill may constitute two such localities, one on each lateral slope, because it is from these slopes that the fire comes which especially influences the attack. Therefore it is frequently desirable to do what the old rule forbade: namely, "split" the hill, and assign as one distinct task the operations in the approach over the terrain between the crests of two adjacent ridges (Connolly, F.E. 6, C. & G.S.S., 1933-34).

Infantry officers have a known bias for decentralization of auxiliaries. Rifle-company officers used to have a bias for decentralization of heavy machine guns. Some officers still have a deep conviction that heavy machine guns must, as if by natural law, be organic parts of the battalion; although this is a thing likely to change in the near future.

In the early part of the World War, attached artillery was sometimes villainously mishandled by the lower infantry echelons; better results could have been attained by the system of direct support (Review of Military Literature, C. & G.S.S., March, 1933, 62 ff). Many of our officers will remember how poorly our own machine guns were employed in France during the early period when higher commanders were habitually applying the "principle" of unity of command by decentralizing them to rifle companies in order to provide unity of command within the smaller units (Review of Military Literature, C. & G.S.S., December, 1934, p. 22). These examples indicate the fallacy of the view that unity of command is necessary to success; there are occasions when it is *detrimental.* Desirable enough, in the great majority of cases, as to the high command in a given theater, it does not follow that it is desirable as to the control of all means in all echelons, even

were this possible. *It is a poor "principle" that serves well enough as to the supreme command, but that does not fill the needs of the great mass of junior leaders who constitute 99.9% of the command system.*

The fact is, of course, that the correct control system in any situation depends upon certain factors, and that any principle which is to be relied on as a guide must cite those factors. This is the thing that *Field Service Regulations* should do. But there is no basic discussion in *Field Service Regulations* of the influence of such factors on control, and the best we can do is to investigate what is said, incidentally, as to control of artillery.

Field Service Regulations tells us (72) that as long as a commander can exercise effective control of his artillery, he does not decentralize it; but if distance, visibility, or lack of adequate signal communications necessitates such action, he does decentralize. However, the weaker his artillery, the more desirable centralization (F.S.R., 409), provided, naturally, that such control is effective. There are also other fragmentary discussions of control of artillery in the *Field Service Regulations. It is regrettable that they are not assembled in one place.* And inasmuch as the same factors determine the control of *all* auxiliaries, the entire discussion should be couched in fundamental terms and included early and conspicuously in the book.

But centralization and decentralization are not merely questions of control of auxiliaries, but of *all* the troops. Centralization of all means to a high degree may be desirable, for example, to strike a powerful blow or to parry one, while decentralization may be desirable for speed in dealing with local emergencies. (F.S.R., 70, 409, 431, 479, 567.)

Accordingly, as was noted under discussion of movement, decentralization in the control of a movement may be desirable if operating with an aggressive mission, against a weak or poorly-trained or unaggressive enemy, if our own troops are relatively strong, in good condition, well-trained, and of high morale, and if our signal system is inadequate to the demands of centralization. Any of these factors may justify such a method. On the other hand, a change as to any one of them may make it desirable to centralize control; or poor visibility, the presence of obstacles to our movement, and short distance to the enemy may have a like effect. In either case, the method

to be used will also be influenced by the probable consequences of failure if the other method is used and fails.

Every intermediate phase between these two extremes will be encountered in war, and sound training will accustom leaders to take the action appropriate to the *object*, comparative *means*, the *theater*, and the *consequences of failure*.

The influence of personality—so inadequately portrayed in theoretical instruction at present—may have a dominant effect on the control system. Thus, Lord Roberts, at the Peiwar Kotal, having with him two subordinate generals, "one worse than the other," took the worse of the two with him on the turning movement, and left the other to confront the enemy, with orders to do nothing. (Wilkinson: Thirty-Five Years, 162.)

The discussion of control, such as should appear in *Field Service Regulations*, should also emphasize the true relations of authority and responsibility. Thus it is well enough understood among soldiers—and this is very complimentary to them—that a commander should be charged with responsibility commensurate with his authority. But it is not so well understood that a commander's responsibility should be no greater than his authority. Lip-service is paid to this idea, to be sure. Soldiers sympathize with Lee (Freeman, II, 50) in West Virginia with all the responsibility of coordinating operations, and lacking authority to do so. They also appreciate Haig's stand in his controversy with Nivelle (Robertson, II, 302); he merely demanded authority proportioned to his responsibility. And yet, notwithstanding the appreciation of such difficulties, we find in practice our army endeavoring to apply the contrary theory that a commander is responsible for everything, right or wrong, that occurs in his unit, irrespective of his power to control events.

This system, however workable in peace, is unpractical in war because its injustice saps the loyalty and incurs the resentment of those on whom it is practiced. And in war, commanders, especially in lower grades, are peculiarly dependent on the loyalty of their subordinates. Senior officers can be bullied even in war; the consequences of failure to comply with expectations, however unjust, are too formidable. But junior officers and enlisted men, especially those in combat units, can easily find a variety of ways to defeat such expectation without undue risk—especially in an army which does not shoot stragglers. Combat junior officers and enlisted

men have in war, aside from self-respect, little to gain and much to lose by doing their plain duty. Hence the great practical importance of that truth which states that *the appropriate responsibility of an individual is determined by the means made available to him to control events.* If there is anything supremely important in war, it is this; yet there is no general clear understanding of the fact in the service at large, nor any clear statement of it in *Field Service Regulations.*

Training

The *Field Service Regulations* should contain a clear statement which will serve as a basic directive as to training: that the proper character and amount of training for any individual or unit are determined by the *task* to be performed, the characteristics of personnel and of other *means* made available, by the character and equipment of the *enemy*, by the conditions of the *theater*, and by the probable *consequences of failure* to attain an adequate training level.

Timing

One finds here and there excellent discussions of the timing of operations, to gain unity of effort, such as the explanation in Lieutenant-General Sir John Monash's "Australian Victories in France" (p. 50); but not in our *Field Service Regulations.*

The need of such a treatment of this subject is evidenced by the mental gymnastics whereby effort is sometimes made to evolve a "principle" as to this matter. For example, our doctrine as to the hour of attack against a river line or a hostile shore has at times been presented as this: that the attack should be launched at such an hour that, by daylight, our troops will have secured the critical terrain from which the hostile machine guns command the beaches, and will be ready to advance therefrom.

But this is merely one *method.* If conditions are favorable—as, the enemy relatively weak, the ground and visibility good—we may be able to do *more* than this by daylight. However, if determining factors are unfavorable, we may have to be content with *less.*

Some of the determining factors were well brought out by the first landing-attacks at Gallipoli.

For instance, the Anzac beaches faced the setting moon, which was bright, and illuminated the approach by sea till 2:57 AM. However, it was believed that the beaches could

be found without difficulty after moonset. It was possible to approach after moonset and then land in the gray of dawn, but no earlier. It was desirable to land at or before dawn, for surprise. So the landing was made at dawn.

At Helles, however, the moon was less of a factor, since the beaches faced south; but the determining factors were: the fear of shoals and swift local currents, and the small size of the beaches, which made it difficult to find them by night. So the attack was made after dawn. (British Official History, I, 170, 217.)

Then there is the timing of attacks with reference to each other. *Field Service Regulations* gives a very partial treatment of this, authorizing the launching of frontal and flank attacks simultaneously, or the frontal attack first. Actually either may be launched first with good effect. Napoleon preferred to launch the flank attack first (Wilkinson: Rise of General Bonaparte, 106). War provides examples of all three methods (Callwell, 140 ff). The correct one depends upon all the factors which influence the situation.

Military Organization

Since organization is the *mechanism of control* (Hunt, 7), the fundamentals of military organization properly form a part of any discussion of control.

Organization is no "high-brow" pursuit. It is a continuing practical problem in war as well as peace, and for every leader from squad to general headquarters. The organization issued in tables is merely a first step. No matter how good it is, it has to be adapted in the field to fit each particular situation. This fact, pointed out by Guibert some two centuries ago (Wilkinson: The French Army, etc., 72), is no less true today.

Yet, at this particular moment, when interest in this subject is so widespread, and when so much work is being done on it, *an officer of our army cannot go to Field Service Regulations*—the basic book on our doctrine of war—*and find a statement of the fundamentals of military organization.*

Of course our officers can find in *Field Service Regulations* a few facts about our existing organization (or our organization of 1923), but even these facts are really more appropriate to *Manual for Commanders of Large Units* than to *Field Service Regulations. Manual for Commanders of Large Units* is the place for discussion of functions of the corps and army; for these are changing things. Our Civil-War corps was really

what we now call a division (Sherman, II, 385); and our organization of 1914 did not include the corps at all (F.S.R., 1914, par. 3). Styles change as to these matters.

Nor is the information given in *Field Service Regulations*, even when of basic character, necessarily correct. Thus, the division need not necessarily be self-sufficient for supply (F.S.R., 3); in fact, proposals to change this feature have emanated from high authority. If a unit is, in fact, *the smallest permanent unit of both close and long-range combat, designed as a flexible mechanism so that it can meet changes in the situation by the rapid regrouping of its means into a series of fluid combinations* (Gilbert, 120; Foster, 211; Ency. Brit. strategy; Lucas, 172)—then that unit is a *division*, irrespective of whether it includes its own organic service agencies, or is supplied by higher echelons.

The *Field Service Regulations* should avoid such unduly restrictive definitions.

It should also avoid committing itself to such long-term prophecies as that "the infantry division is the basis of the organization of the field forces" (F.S.R., 3). The infantry division is in fact the basis of such organization today, has been for the past two centuries, and was in the day of the Roman Legion. But in the meantime a horse unit, the Mongol Tuman—a true division—had appeared as the basis of organization (Lamb, 218-220) of the most efficient army of medieval times, if not of all time. In fact, cavalry was for centuries the basic arm in Europe. And no one knows what will happen next—perhaps very soon.

But this much can be said, that history and logic both argue that the division, in some form, is here to stay, and that land forces, and perhaps also air forces, will have several types of division. They will probably have a division *primarily for power* (like the infantry division of today), and another *for great mobility* (like the present cavalry division); although appearances will certainly undergo radical changes. And they will probably also have divisions of special nature, like the fortress troops which exist all over the world today; it is not unlikely that special divisions for defense may be organized as distinguished from mobile divisions (the French have worked on this, as official reports show), and special divisions may also be organized to occupy territory and/or to protect communications and bases if war becomes very mobile.

It is in such terms as these—of power, offensive power, defensive power, and mobility—*which will remain applicable forever* that a basic text like *Field Service Regulations* should discuss these units. The *Manual for Commanders of Large Units* is the proper place for the discussion of such transitory things as the infantry and cavalry divisions, in the form in which they now—ephemerally—exist.

Other similar specialized manuals for commanders of smaller units are the proper place for discussion of organization of such units as they now exist.

General Pershing, soon after the World War (Wrapper Indorsement), referred to the infantry battalion as "the real combat unit in war," having in mind that the employment of all infantry weapons was then normally combined in the battalion as the complete unit of infantry combat (F.S.R., 54), which is still our war-strength organization today.

But this is not also true of our peace organization, in which the complete unit of combat is the regiment, it being, except in poor visibility, uneconomical to employ long-range weapons like the caliber-.30 machine gun or the infantry cannon as battalion weapons in so small a command. And this will be equally so in many cases in war, because battalions are normally depleted in war.

Furthermore, our complete unit of close combat prior to the World War was the regiment (Sherman, last chapter), and this will probably soon be so again.

The *Field Service Regulations* should treat this subject in a basic manner, showing that just as the division is the combined unit of close and long-range combat, so, within the division, there is *an organic unit of close combat* which disposes of all the means made available for fighting of that sort. The *Field Service Regulations* should, however, omit the name of this unit, because the name may change.

In like manner, the *Field Service Regulations* should omit references except in very general terms to other units within the division, because they are mere links in control, and their designations and functions may change.

The *Field Service Regulations* should also discuss in a fundamental manner the subject of *subdivision* for purposes of control. It should show that the number of subdivisions in any unit is determined by the *object* which the unit is to carry out (the way it does its work), by the *opposition* it will meet, and by the limitations imposed by the *means available*,

by the *theater*, and by the *consequences of failure*. It should point out that training, which will probably be low in our army in a great war, and kept low by casualties, is one of the determining factors as to the means available. A low level of training argues for small units in the lower echelons, with the minimum rather than the maximum number of subdivisions, in order to facilitate control.

Field Service Regulations should show the comparative advantages and disadvantages of subdivision into two, three, or four parts; how, for close-combat units, two subdivisions provide one to fix and one to maneuver, while three also provide a reserve, and four provide all the foregoing and also permit maneuver around both flanks. It should show that four subdivisions are also convenient for penetrations.

It should show how the advantages of subdivision into two or three can be gained in subdivision into four, by carrying extra overhead so that the four can be combined, as desired, into three or two sub-units. This system has been demonstrated in the British rifle platoon, which is divided into four sections (our squad) which can be combined into three or into two by the use of noncommissioned officers of the platoon overhead (Pakenham-Walsh, 23).

The *Field Service Regulations* should avoid committing itself to any particular type of division, such as the "one-road" division, which can march on one road, deploy, and fight a severe engagement in one day. Favored by General Pershing (Wrapper Indorsement) and by other distinguished officers, and unquestionably desirable for our army today, this may nevertheless not always be the case. The character of the *means* and of the *theater* has everything to do with this, and *Field Service Regulations* may some day be read, for information, by American commanders whose situation is very different from ours today.

The American Expeditionary Force in France in 1917 made little use of *Field Service Regulations* in effecting the ground-work of its organization. But this should not be the case again. A good *Field Service Regulations* should meet the needs of the commander of *any American Expeditionary Force anywhere at any time.**

*NOTE.—The essentials of the foregoing discussion of organization may be found in A.W.C., G-3 17, Report of Committee No. 8, 1934-35.

Command Areas

The *Field Service Regulations* should include, under control, a basic discussion of command areas: of the method of defining, in space, the responsibilities of a commander. If this is properly done, we will not have a repetition of the absurd situation at service schools (referred to above) when officers were exercising themselves over whether it was a "violation" of a "principle" to designate a command area for a company by use of boundaries, when *Field Service Regulations* 406 seems to forbid.

Actually, there are several methods of designating command areas, and all of them should be pointed out. Then the factors governing the choice of method should be discussed. Cases have occurred in night raids where boundaries were very useful in defining command areas for units *as small as squads*. Other cases have occurred where the indication of a direction was sufficient for a unit *as large as a division*.

The factors determining such matters are in reality the same which we have noted as governing every other subject discussed above. These factors should be listed in *Field Service Regulations*, their influence discussed, the possible methods pointed out—and the soldier left free to make his choice as a result of the professional training, by example and experience, to be given him by his duty with troops and his study in the schools.

Basic Factors

The nature of the basic factors which determine the results of all operations of war is shown in history and—usually in a fragmentary and disjointed manner—in various military commentaries.

Owing to the experience of the thousands of officers who have used them and worked on them, the best assembled lists of such factors are to be found in the various forms for the estimate of the situation.

Our form in *Staff Officers' Field Manual* (Part One) contains a detailed list, but the factors are scattered throughout the form, and are not well organized.

Our *Abbreviated Form for the Estimate of the Situation* (C. & G.S.S.) includes an excellent summary of the factors in the three test-questions to be applied to any plan. For instance: Will the plan, if successful, accomplish the mission and facilitate the operations of friendly troops? The factor

here is the *object.* Again: Considering time, space, terrain, and all the factors of relative combat strength, has the plan a reasonable chance of success? The factors here are three: *means available, means opposed,* and *characteristics of the theater.* Finally: If the plan fails, what will be the probable results? The factor here is the *probable consequences of failure.*

What is needed, in addition to this, is a detailed list of the factors under *means,* and under *characteristics of the theater.*

The Navy Form for the Estimate (Estimate of the Situation, Plans, and Orders, N.W.C., 1932, pp. 3 ff and 9 ff) lists all such factors in one place, under relative strength (paragraph 2), and under nine headings: political and economic; geographical; weather; information and security service; composition, condition, and disposition; material; racial characteristics, morale, and skill; logistic support; and "other factors."

The Army War College, G-2 Course, organizes the factors under five heads: political, geographic, economic, psychologic, and military (including naval).

Probably the best method would be to organize factors relating to *means* under headings of political, economic, psychological, and military; and the factors as to the *theater* under a heading referring to geographical, meteorological, and similar matters.

Principles

The opening page of *Field Service Regulations* (p. iii) announces that the book presents principles for our guidance. It warns against the use of set-rules, and informs us that there is a difference (unexplained) between a principle and a method, and that a correct principle affords a basis for selecting correct methods of action in any situation.

This statement also appeared in previous *Field Service Regulations* (see F.S.R., 1914), and was apparently copied almost word for word from the British *Field Service Regulations* of 1909 (p. 11). The latter made the point that a lifetime of study of the principles of his profession enables a soldier to apply them in emergency almost by instinct.

The underlying logic of this theory is that a man whose knowledge is caught up and simplified in terms of principles is so much the better equipped to act *correctly* and *swiftly.* This was the considered view of Foch (Principles, 19; see also Bugnet, 20, 139) and of Clausewitz (I, 117-118) as well.

As to this, Clausewitz said, "The moral re-action, the ever-changing form of things, make it necessary for the chief

actor" (in war) "to carry in himself the whole apparatus of his knowledge, that anywhere and at every pulse-beat he may be capable of giving the requisite decision from himself. Knowledge must, by this complete assimilation with his mind and life, be converted into real power."

There never was a better statement by any man, soldier or civilian, of the primary purpose of the *scientific method.* For it is this same theory that underlies the successes of modern science.

Human beings, however little they may consciously realize it, constantly endeavor to apply this theory; they endeavor constantly, though with varying success, to apply the scientific method to their own affairs. Through uncounted generations, even long before they became human, our forebears relied on natural law. Our entire life is conditioned by it, and if we could not depend on the sure succession of night and day, of the seasons of the year, of the same effect always following the identic cause, we could do no effective planning or execution at all (Hocking, 12). In fact, from early childhood we go through life explaining things to ourselves by formulating, rejecting, and re-formulating rules of action—usually very faulty ones—based on our observation of things as they are (Jastrow, 17-20). Our trouble arises from the fact, not only that we do not always follow our own rules, but that *our rules are so seldom really reliable.* But, whether reliable or not, we are so made that we have to have them, and we keep on perpetually, as we should, trying to improve them.

A principle, in the scientific—and therefore in the correct—sense, is a natural law: *a truth that applies to all cases.* Such a principle organizes knowledge and makes it immediately available for practical use. (Hunt, 6, 21; Ferry, 16; East, 653.) For instance, it is by studying the laws of disease that a physician is enabled to make his diagnosis and determine correct methods of treatment (Clendening, 325, 331). Scientific thinking is no different from common thinking, nor scientific knowledge from common knowledge, except that it is more accurate (Huxley, Chapter I; Conklin, 453; East, 652). The great advances in civilization: airplane, radio, telephone, and so on, are all results of studying out and applying certain principles connected with matters such as combustion, electricity, engine construction, wave-lengths, and electro-magnetics (Jastrow, 17-20, 42, 90).

Human beings sometimes do things pretty well by copy-work and by painful experience, without knowing much about the laws which determine the results of their acts. But progress comes from studying out why things happen as they do. And a knowledge of the principles back of the practice—of the science back of the art—is particularly helpful for simple, effective *teaching*. (Jastrow, *see above*.) It is therefore particularly desirable for a work like *Field Service Regulations*, which is the basic tactical and strategic textbook of the army.

The astonishing thing, then—if human beings were not so awkward at formulating principles, though so properly determined to do it—the astonishing thing about *Field Service Regulations* is that one searches in vain to find the principles referred to on its opening page. Except in fragments, they do not appear. The book is a discussion of *methods*. The resulting emphasis on methods—the treatment of them as if they were principles—is an invitation to the army officer to accept the method as a safe rule of action, as if it were a principle; in which case *the method*, so employed, *becomes one of those very set-rules against which Field Service Regulations issues such solemn warning*.

To state a method, then to qualify it by "generally" or "ordinarily," is not to convert it into a principle. There is no "general" or "ordinary" case in war. Each case "is always a *particular* one," says Foch (Principles, 13), italicizing "particular," "and has to be considered by itself."

By contrast, suppose we look into Newton's procedure in evolving a principle. He was interested in the motion of bodies in space. He assembled, by careful investigation, *all* the facts so far as he could find them. Thereafter he refined his facts into a set of factors—*all* the factors, so far as he could discover them—which appeared to him to determine the action of such bodies with reference to each other. These factors, he thought, were the masses of the bodies (the amount of matter in them) and the distance between their respective centers of mass. He then stated his conclusions in the form of a principle which expresses, simply, the manner in which these factors influence the force of attraction between the bodies. Such is the Law of Gravity. (Ferry, 120.)

In like manner, if we state accurately the manner in which *all* the factors influence action in war, we shall have a principle, or set of principles, as to employment of combat power. We have, in fact, used the principles throughout this

study; for whenever we stated that the employment of combat power is determined by the object, the means, the theater, and the consequences of failure, we enunciated a principle. It is unnecessary to re-state the principles here, but they will be found, with all the factors listed, in the Appendix.

As to this entire matter, a committee at the Army War College, charged with determining "the simple but basic factors involved in military planning and execution" of joint operations (A.W.C., C.W.C. No. 1, Orientation, Analytical Studies), reported as follows: "Our study indicates that the factors which determined success or failure were in all cases those 'simple but basic factors' which determine all the operations of war. These factors are listed in the form for the estimate of the situation, but the long list given therein can be simplified to a relatively few fundamentals. These are:

1st: The *object* to be attained.

2d: The *means available* and *in opposition*, including:
Fire-power and *shock-power*
Physical capabilities of movement
Physical vulnerability
Signal communication
Morale and *training.*

3d: The *conditions of the theater*, including:
Distance
Obstacles
Visibility.

4th: The *consequences of failure.*

"These basic factors rarely have the same values in any two situations, and therefore appropriate methods to be used to gain unity of effort in any situation are deduced by a study of the influence of the basic factors in that particular case. The one reliable and practical principle to be used as a guide in war is simply that *the effective employment of combat power to gain unity of effort varies with* these factors. There is no substitute for the elementary fact that everything depends on the situation, and that sound methods are to be evolved only by the just appreciation of existing facts and by the application of common sense in order to produce plans and execution suited to existing conditions." (A.W.C., C.W.C. No. 16-A, 1934-35, p. 19.)

These principles can no more be "violated" than any other natural law. Unlike man-made statutes, natural laws of this sort do not forbid or advise. They do not say "do,"

"don't," "should," "ought to," or anything of that sort. They simply state *a condition* as a fact. They do not tell us to seize a terrain feature, to attack the hostile force, to interrupt hostile supply; nor to penetrate only if we cannot envelop; nor to attack unless we have to defend; nor to exploit weakness, nor to oppose strength to strength; nor to play safe, nor to plunge in; nor to centralize, nor to decentralize. They do not tell us to employ any particular *method*. Such faulty rules should be avoided (see footnote). But they do tell us that in working out correct methods we do well to remember that *it is the influence exerted by the factors listed in the principles which will determine results.*

These principles should appear early in *Field Service Regulations*, coupled with a clear statement of what a *principle* is, what a *method* is, what a *policy* is, and what a *doctrine* is. They should also be accompanied by a definite warning of the danger of accepting a method as a principle, and of following it as if in fact it were what it is not.

The result of undue emphasis on certain methods at the expense of others is to create *conventions* of practice. One of the conventions thus established in our army has been to seek combat, rather than to make the utmost of maneuver (Stilwell). Another is our predilection for forward slopes, notwithstanding the prominence of reverse slopes in the doctrine of 1918 (Review of Military Literature, December, 1934, 10-12).

One of Moltke's staff-rides hinged on a choice between two defensive positions, one of which was very strong, the other only reasonably so. The correct solution was to occupy the weaker position, because the enemy would certainly turn the stronger, but might be induced to attack the other, in which case there was a reasonable chance of severely defeating him. (Wilkinson: War and Policy, 173.) That is the kind of *practical* reasoning that is effective in war; but it is not typical of the *conventional* reasoning which characterizes our problems in peace.*

Until our doctrine recognizes in fact the true nature and utility of principles to which it pays a lip-service in theory, all of our dignified but vague discussions of these principles will be to no purpose; nay, more, it is worse than professional camouflage, because it deceives *ourselves*. The existing situ-

* As to faulty rules, see *Review of Military Literature*, June, 1934, p. 89, *A Science of War.*

ation can be no better illustrated than by the experience of an officer, of no little responsibility, who submitted a draft of an important document on training, at the beginning of which he inserted what is unquestionably *the* basic principle of training, the substance of which was much like that given in the previous discussion of training in this study. The document thus submitted was in due course returned to this officer from high authority, bearing the following comment: "This study should begin with a statement of principles."

It is this situation, especially, that Field Service Regulations should correct.

Conclusions

Field Service Regulations, then, to be truly the basic authority on our doctrine of war, should be applicable to *war of any sort and to units of all kinds.* It should therefore deal in fundamentals which will *never change*, and should studiously avoid discussion of details which will change with alterations in organization and equipment. Accordingly, it should include a statement of *principles as to the employment of combat power*, a discussion of the *fundamental characteristics of combat power*, and a discussion of those *methods of employing these characteristics which are basic*, and therefore will not change. It should also include, as at present, a discussion of the *various operations* occurring in war; this discussion, also, should be in terms which *will not require revision* with changes in organization and equipment.

Carrying the present evident trend to its logical conclusion, the policy thus established should relegate to other specialized publications, such as already exist, the details thus excluded from *Field Service Regulations.* These publications may be revised with current changes, without affecting in any way the basic doctrine in *Field Service Regulations.* Confusing contradictions between *Field Service Regulations* and other publications may thus be avoided.

[Note: In order to demonstrate that the preceding recommendations are practical, Major Johnston has prepared an Appendix in which he includes suggested passages from an imaginary revised edition of the *Field Service Regulations.* This Appendix will appear in the next issue of the *Review of Military Literature.—Editor.*]

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Section 2

ABSTRACTS OF FOREIGN-LANGUAGE ARTICLES

This section contains abstracts of important articles from foreign military periodicals; the remaining articles for each magazine are listed in Section 4.

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THEORIES OF MECHANIZATION AND MOTORIZATION

By Major F. During, Infantry

The modernization of armies is the foremost question today. England, Russia, Germany, Italy and finally France, have resolutely taken action in that connection. To modernize means to exploit the developments of industry for the benefit of the offensive and defensive power of units, and especially to increase their mobility, is a most important factor to the High Command as it will extend the field of the latter's plans.

In France, the visible signs of such transformations are the organization of a light division, entirely mechanized, and the motorization of a part of the French covering forces.

In the French Army, the organization of these large modern units would seem primarily to meet the requirement of being able to cope as rapidly as possible with a combat situation which will undoubtedly arise during the first phase of operations, by reason of the initial defensive attitude of the French troops; that is, to repulse enemy forces—no doubt also mechanized and motorized—which intend to penetrate France. This operation implies the reconnoitering of an enemy whose position and strength will probably be ill-defined,

Abstracted from *Le Temps*. "Theorie de mécanisation et motorisation," by General Baratier

followed by operations purporting to defeat an attempt to penetrate France.

It is generally considered that the light mechanized division is designated to carry out, for the benefit of the large motorized units, distant reconnaissance and covering missions, normally assigned to the cavalry divisions in the case of large units of a normal type. Very mobile and well provided with reconnaissance and combat armored organizations, it can not only be engaged on a wide front for the purpose of determining the apparent enemy situation—as ordinary cavalry can do—but penetrate successive curtains of troops, back of which the enemy will endeavor to conceal his intentions. Sham resistances, or even a close network of machine guns, will not be able to check the advance of a light mechanized division. After having forced the enemy's advanced elements to withdraw, it may come upon a strongly organized position whose importance will be disclosed by the fact that it is powerless to capture it, at which time the light division will have fulfilled its mission. The motorized divisions having arrived close to the combat zone during the reconnaissance phase, will now attack on the fronts assigned to them by the High Command.

Theoretically, therefore, the putting into action of these large units is very simple, so simple, in fact, that many authors, in Germany especially, consider that peace-time units should include only elements of this kind. Aside from the very high cost price, as well as the enormous amount of gasoline needed, from complications inherent to their refueling in the field, down to the large number of specialized personnel required for their maintenance, in actual use their handling is beset with so many difficulties that it is logical to envisage with caution the increasing of their numbers.

Indeed, everything is new in the handling of these large units whose mobility is the chief justification of their existence.

Insofar as the conditions of the employment of a light mechanized division are concerned, no lesson can be deduced from a study of the late war, for no such unit existed at the time; it would only disclose incomplete information as to the use of motorized units. The numerous troop movements made in trucks from 1916 to 1918 detrucked in the beginning without any means of reconnaissance and without any organic artillery. Later on, these movements were perfected and the trucks transported likewise guns and a few horses needed to

carry out reconnaissances for the division and enable its guns to go into action. The divisions thus moved were deprived of a large number of their organic elements and were unable to participate at once in any offensive operation and all that was required of these divisions was to resist on the spot.

Today, the light mechanized division and the motorized units may attack without delay since they can arrive with all their combat means in the region where they will go into action; but to arrive at this result, a number of problems must be solved, the solutions of which can be disclosed by experience only. *Traveling on one road, a light mechanized division forms an interminable ribbon of about 93 miles long, which length is reduced to about 43 miles in the case of motorized divisions. In order not to lose the benefit of surprise action, it is therefore necessary to break up these units and assign to them parallel roads and hence the difficulty of command is increased.*

All these units must advance from one terrain feature to another in order to protect themselves against a possible intervention of the enemy armored weapons and for the purpose of remaining in control of the road net.

The scouting elements, rapid armored cars and aviation, being way ahead of the light mechanized division, have the mission of determining the enemy's position and directing toward this position not only the main body of the mechanized division, but also the motorized divisions. Now, *if these large units have advanced too quickly in a wrong direction, they will have to change their direction of advance which the road net may not permit even under the most favorable conditions, and this is liable to produce confusion in the columns and a state of congestion of the roads which can only be overcome with difficulty. As the motorized divisions approach the dangerous zone, they will have to advance cautiously in order to prevent the infantry, which they transport, to detruck under fire.*

In order to avoid such errors, it is indispensable that the responsible commanders of modern large units be accurately informed of the enemy. This brings up the question where and with what unit should they march in order to use to the best advantage the information they receive.

If, in accordance with the former erroneous conception, they march with the main body of the troops along an itinerary fixed in advance, they will risk being informed too late of any change which should be made in the direction of their columns, due to the distances to be covered by messages for-

warded overland (for the entire operation can not be based upon a faultless operation of the radio). It would therefore seem that commanders should endeavor to meet such information half-way; that is, that they should march well ahead of their troops and with the main body of the reconnaissance elements. They should have at their disposal cross-country liaison cars capable of replacing the radio if need be. In this way they could either halt their columns, awaiting additional enemy information, push their advance, or make any changes in the direction of the march.

Whatever may be the solution adopted with regard to an approach march—as the result of tests being carried on—the fact remains that once the combat zone is reached, the commanders of modern units will have to act quickly. There will be no more drafting of those long and detailed orders in the quiet of their command post, which were fully justified in stabilized warfare when the enemy was in a fixed position which had been well reconnoitered. In the tumult of battle, the command post is in an armored car, and it is here that commanders will have to draft short and clear orders with the cool-headedness which characterized leaders of former days.

While the developments of science have unquestionably made for the speedy forwarding of orders and rapid maneuvering, it is curious to note that they nevertheless tend to revive the old methods of command which prevailed at a time when—compared with those of today—armaments were still in their infancy.

CRITICAL OBSERVATIONS ON ANTITANK DEFENSE

By Lieutenant Colonel S.J. Heidner, Infantry

With the increase in the number of tanks in foreign armies, the question of antitank defense becomes increasingly important. That this fact is correctly appreciated in foreign armies, is shown by the fact that everywhere modern antitank weapons are being manufactured. In this connection, the general opinion is that the tank itself is the best defensive weapon against hostile tanks. For this reason most of the tanks in foreign armies are being equipped with armor-piercing weapons. There is much discussion in technical magazines at home and abroad over the question as to which has the greater

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Abstracted from *Sanct Christophorus*, November 1935. "Kritische Betrachtungen zur 'Abwehr von Kampfwagen'."

promise of success: the tank, or the antitank weapon. These views are so varied and so contradictory that it is worthwhile to examine in more detail some of the points involved. First of all, the question can not now be finally answered because of the many new developments in tanks which have greatly increased their capabilities. When a former member of a World War tank unit, influenced by his experiences with the well-known Renault tank which had many mishaps when meeting with German artillery, thinks that the defense is unquestionably superior, as is the case in the article by Major Poupel in *Revue de Cavalerie*, September-October 1934, then it is not surprising that in certain circles opposed to the idea of the tank, the opinion is growing that the tank must be inferior to the modern antitank weapons.

During the war the fastest tanks used at the front had a maximum speed of 5 miles per hour. The average practicable speed was slower than the march rate of infantry. Compared to this, modern tanks with all their weapons in action can average from 12 to 18 miles per hour and even more.

Information About Hostile Tank Attack

Whether or not a hostile massed tank attack, striking by surprise, can be repulsed, depends primarily upon the correct employment of the defensive means and the proper disposition of the antitank weapons. It is assumed that the defender has the necessary means for defense. Timely information about the hostile tank attack is essential. Aviation, observation posts of the artillery and defense units, and the alertness of front-line troops must be depended upon for this information. Sight and hearing must be used to detect the approach of hostile tanks. From a careful study of the terrain the defender should know where a hostile tank attack is possible, probable, or impossible. Such a study will also reveal the likely routes of approach and forming-up places for the hostile tanks. To gain this information the aviator must observe, and ground troops must observe and listen.

At present, part of the antitank weapons belong organically to the lower units and are installed in their sectors. Those antitank weapons assigned to the higher units in foreign armies are generally motorized so that they may be rushed to any point where hostile tanks may strike. It is planned to use the mobile weapons of the higher echelons only in a crisis, for they are the only weapons available to strengthen the

defense of the lower echelons. However, unless the hostile attack is discovered in time, it will not be possible to bring these mobile weapons to the critical point in time to go into action.

How can the approaching tanks be detected? In this age of motors it will be difficult to distinguish a tank by its noise at a distance of more than a half mile. Even then it will require a good ear to pick out tanks from the din of the many motors that will be heard on the field of battle. But if tanks are not detected until they are within a half mile, it will be too late. Besides, the enemy, who for any reason must assemble his tanks close behind the front line, which will be the exception in the future, will attempt to drown out their noise with artillery and machine-gun fire and with airplanes. For this reason the eyes must work since tanks can easily be detected by their tracks, and when using field roads, by the dust they raise.

Having detected the approaching tanks, it is essential that the information be promptly transmitted to the antitank units. The telephone and the radio-telephone are suitable for this purpose. The communications system must function with certainty because the antitank units of the higher echelons must dash forward on short notice if they are to be in place on time.

Utilization of Obstacles

Any kind of obstacle on the defensive front will materially lighten the burden of the defense. If time and means are available, natural obstacles may be improved by artificial means. Permanent security from tanks can be given only by obstacles which absolutely prevent the passage of tanks. Such obstacles might be called "tank-proof." Slopes of over 45 degrees, very wide and deep ditches, and forests with old trees, closely spaced, are tank-proof obstacles. Wide water courses are also tank-proof, providing amphibian tanks are not used. Ditches can be overcome by simple means such as steel beams, fascines, etc., and heavy tanks can knock down large trees to make way for lighter tanks to follow. Small tanks can feel their way through even a dense forest. In general, obstacles are only effective when they are covered by fire which will prevent the tank crews from preparing means to overcome them. The defender is really only secure from hostile tanks when he has destroyed them.

Mine fields which are well camouflaged have a good effect against tanks driving over them. It is important to make these fields wide rather than deep, for they are only effective against the leading vehicles. The following ones will at once avoid such ground to prevent destruction. The timely removal of markers set out for the protection of friendly troops must not be forgotten. It happened in the war that markers were left in position to warn the approaching tanks of the presence of mine fields.

The preparation of artificial obstacles requires much time and material. It is easy to say that trees will be felled, that farm wagons will be procured, that wire will be brought up, or that streams will be dammed. But, in the first place, these things must exist, and then it will require much labor to put them into shape. Small units are not prepared for such work. Effective dams can only be constructed by engineers, and to fell large trees requires the proper saws, etc. For this reason every commander must make a timely estimate to determine what measures the available time and personnel will permit him to take. Major Poupel, in the *Revue de Cavalerie*, concludes from these considerations that another solution is necessary. He sees a solution in the use of overcharged hand grenades, and in the use of prepared obstacles which are carried along. Bundles of hand grenades were used successfully in many cases in the World War. However, it must be remembered that these grenades were thrown at tanks which crept along at 2½ miles per hour or less, and furthermore, against tanks which had no weapons pointing to the rear. Today, with fast tanks it would be a different matter. One will not now be able to wait calmly to attack the tank when it approaches, because beside it there will be another tank, and behind it still others. How can even a courageous grenadier hit the tread of a fast moving tank? Perhaps the tank grenades can still be used in villages, but tanks avoid villages when possible.

Smoke as a Means of Defense

Smoke is an effective agent against tanks because, by restricting the vision, it may easily cause the tanks to lose their direction and liaison with each other. The tank can only fire when it has full vision. The defender will be able to see the tank coming out of a smoke bank before the tank can see him, and should fire on the tank at that moment.

Shelter for Command Posts and Headquarters

Command posts and headquarters are profitable objectives for tank attacks. In the last war, tanks frequently attacked command posts and cleaned them up thoroughly. This has also been much practiced in maneuvers. Tank units that succeed in breaking through are usually employed against headquarters and rearward establishments. If the headquarters are crippled or destroyed, leadership is interfered with or completely interrupted. For this reason every effort must be made to guard the headquarters against surprise attacks.

An interesting account by P. Jewstignjejew, of how a command post may protect itself, is found in *Mechanisazja i motorisazja*. Camouflage is essential to prevent detection of the command posts. Every possible means must be used for this purpose. Above all, it is necessary that traffic to and from the command post is concealed from the enemy. Headquarters should particularly select positions to which hostile tanks cannot approach. If there are any approaches, they must be barricaded and secured. It is important too that the hostile tanks can not approach near enough to fire upon the command post. Unless radio stations are camouflaged to prevent detection, they will frequently betray a command post. The radio aerials must be concealed, and they must of course be so placed that tanks cannot destroy them. All tracks of vehicles and messengers must be obliterated; they are the best possible sign-posts to lead hostile tanks to their objectives. If command posts cannot be placed where they are secure from tanks, it may be worthwhile to construct alternate ones. Dummy command posts may also be used to deceive the enemy, but to be effective they must not be too crude and above all, it is essential that they are occupied. Finally, use must be made of antitank weapons to secure command posts from destruction. The number of such weapons required will depend upon the terrain. Field artillery batteries should also take part in the defense of command posts in their vicinity, and furthermore, for the protection of important command posts, there must be some tanks held in readiness to counterattack.

There is no doubt that this question must be given serious consideration. It should not be dismissed with the simple statement that tanks will not break through.

Antitank Defense by the Infantry

The infantry will be the first to meet the attacking tanks. It has to provide the first defense against them, but it can not do this effectively with rifles and machine guns. Most modern tanks have their aiming and driving slits protected with splinter-proof glass. But even where this is not the case, the infantry, if it fires at the tank, gives away its position so that the tank can attack it. It can not resist tanks effectively with these weapons. What then should the infantry do? Everywhere, in instructions, one reads that he should remain motionless, let the tanks pass by him, and only then begin firing when the infantry which follows the tanks comes into range.

It will require extraordinary coolness and iron nerves on the part of the infantryman to remain quiet while the tanks pass by him, and then, knowing that the tanks are behind his back, to fire calmly at the approaching infantry. One thing is certain: every infantryman who moves will be seen by the tanks and will be attacked. Only well-concealed infantry, that really remains motionless, has a chance of remaining unseen. It will be necessary to remain prone and motionless for self-preservation.

But when should the infantry begin its fight against the infantry that is following the tanks? In order to answer this question it is necessary to picture a modern tank attack in mass. The tanks will approach in waves from a formation in depth. The first wave alone may have a depth of 1,000 yards; tanks will follow each other at distances of perhaps 50 yards. More tanks will be continually appearing. The first wave will pass through and begin operating against the artillery. Then the second wave strikes, again with a formation in depth. Perhaps another wave follows this one. There are tanks and more tanks, but still no hostile infantry. And if we are to imagine the battle entirely modern, we may picture transport tanks arriving loaded with riflemen who will dismount under the protection of the other tanks and attack the motionless defending infantry. What then should the defending infantry do? Infantry armed with rifles and machine guns is hardly fitted to take part at all in a modern battle.

The answer is that it is absolutely necessary for infantry to have under its direct control some antitank weapons. Are the antitank weapons now available, sufficient? This question

is discussed in a recent *Militär-Wochenblatt.* It is stated that an infantry battalion should have at least three antitank weapons, considering that it will have a depth of 300 yards. And besides, the front must be considered. If a division attacks on a front of 2 miles, each of its three regiments will have a front of 1,000 yards, the battalions, there being two in the front line, will have a front of 500 yards. In this zone of 500 yards width and at least 500 yards depth, there would then be only three antitank guns. Perhaps neighboring battalions can fire into the zone with one gun each. But what can these few guns, probably placed rather close together on good terrain, accomplish against a massed tank breakthrough of perhaps 3,000 tanks! Such a number of tanks is not large if France or Russia is assumed as an enemy.

The employment of the antitank guns of the higher units which have been held in a concealed position prepared for action becomes important. The question as to what must be done to have these guns at the right place in time has already been discussed. The infantry has a legitimate interest in wanting these guns close to the front so that they can give protection to the front-line units. Can they be brought up in time? That is the deciding question.

The problem can be solved only if the infantry is equipped with antitank weapons firing an effective projectile, and which are accurate at long ranges. Then also, there must be a large number of these guns in position. This brings with it the objection that those guns in position on the fronts not attacked will serve no purpose. To economize on guns, the utilization of natural obstacles, and the construction of artificial obstacles and mine fields are of great importance. Only through their use can the infantry properly secure itself against a tank attack.

But even then the infantry is not entirely safe because the tanks will attack where there is an approach. The objective of tanks, however, will not be the front-line infantry; they will attempt to break through and attack, first the artillery, and then the troops and establishments in the rear of the defensive zone.

Attention has been called to conditions as they exist in order to prevent having the subject of antitank defense against the masses of modern tanks found in foreign armies, taken too lightly. Too much is made of war experiences, but the conditions are no longer the same. That the antitank defense

problem can be solved by the old means at hand or by iron nerves on the field of battle, as one sometimes hears in the infantry, is idle boasting. Iron nerves are necessary, and they will be there in the battle, but they can last only if they are supported by the knowledge that there are at hand proper weapons and means for meeting the tank attack.

HOW SHALL INFANTRY ACCOMPANY THE TANK ATTACK?

By Major G.J. Braun, Infantry

Recently an article appeared in the *Militär-Wochenblatt* (11 August 1935) which contained the following sentence: "Should the infantryman accompany the tank within the 500-yard zone, very few survivors will remain capable of further combat (due to the effect of the hostile machine-gun concentration against tanks). Should the infantryman follow 500 yards behind the tanks, then the effect of the tanks on the enemy would have vanished since the hostile gunners would have recovered from the shock and would mow down the advancing infantry. The tanks cannot advance slower because they would then fall victims of the antitank fire."

This important sentence which is the crux of the entire tank tactics can lead to erroneous impressions. It is best to examine this statement somewhat closer from the practical viewpoint.

The advance guard of a Blue division attacked with two battalions in a northerly direction in order to drive the enemy across the Z. Creek. The attack was stopped as shown on the sketch and the 3d Battalion of the advance guard received orders to attack on the left of the 2d Battalion. A tank battalion, consisting of 3 light tank companies (each company having 15 light modern tanks organized into 3 platoons), and 7 small tanks organized into one platoon. The battalion staff consists of one communications platoon and one small tank platoon was attached to the advance guard. It received orders to pass through the 3d Battalion when the latter had reached the line: S—L and attack the enemy on Hill 120 and on the southeast slope of Ridge B. After taking Hill 120, the tank battalion was to assemble.

Weak forces of the enemy had been digging in for about three hours. No antitank weapons had been observed; they

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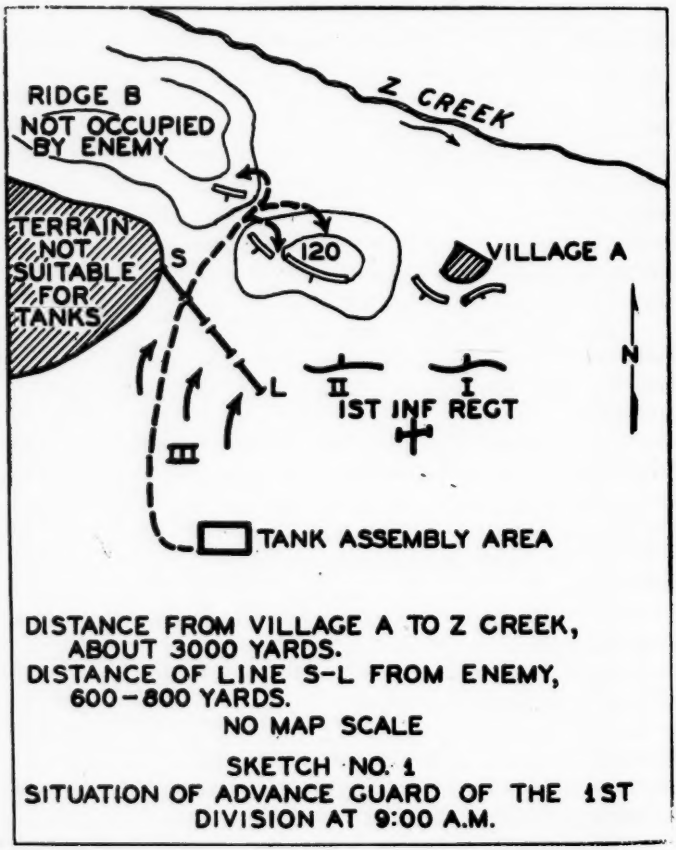
Abstracted from *Militär-Wochenblatt*, 25 September 1935. "Wie soll das Fuszvolk den Tankangriff begleiten?" By M. Braun

may be located in rear of Hill 120. Enemy artillery, estimated at two batteries, has been firing from an unknown position.

The terrain is favorable for tank operations with the exception of the wooded area west of Hill 120. At 9:00 AM Blues have air superiority. It is the intention of the division commander to use the mass of the division for an envelopment at his right (east) flank.

A.—THE USE OF LIGHT TANK BATTALION IN A MEETING ENGAGEMENT



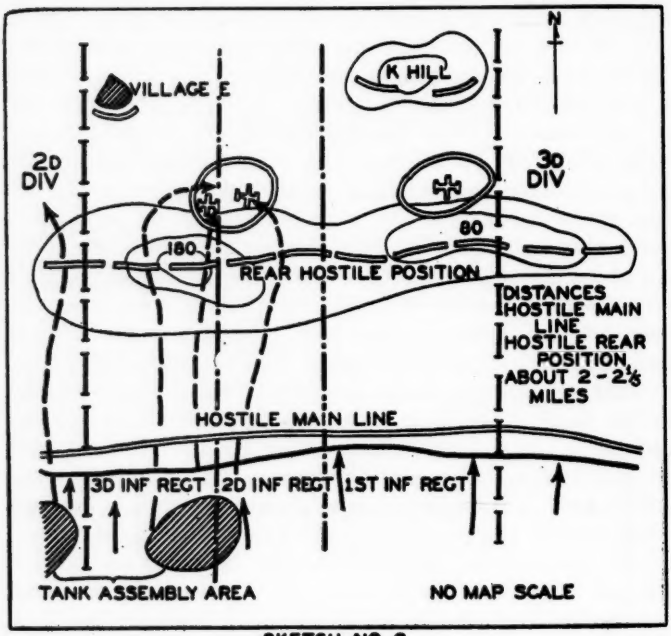
In this situation, how should the infantrymen of the 3d Battalion, which is to operate in conjunction with the tanks,

follow? The tank battalion will advance through the infantry as scheduled with two tank companies in the front line having approximately 20 light tanks in the first wave on a 1,000-yard front, during which time the infantry would be able to advance up to the line: S—L. Some of the small tanks in the first wave will move straight ahead and others to the flank. During this advance of the tanks the riflemen of the 3d Battalion run in small groups behind and between the tanks. Those in the gaps between tanks infiltrate forward making full use of the terrain. Those running behind the tanks can only travel about 100 yards when they must throw themselves on the ground using all available cover, regain their breath and keep up the fire fight until the second wave of the tanks arrive which they follow for another 100 yards. The tank waves are about 500 yards apart. Finally the men move forward with the reserve tank wave and not until this wave has left them are they again on their own. When the first wave of tanks approach Hill 120 it diverts the fire from the infantry to itself, which permits the infantry to rapidly gain ground. In this manner the tanks have assisted the infantry advance without in any manner reducing their speed to conform with the foot soldier, but every infantryman must realize he must utilize every opportunity to gain ground before it is too late, because tanks cannot hold ground for any length of time.

In this situation the objectives for the tanks are Hill 120 and the southern slope of Ridge B. As soon as the tanks have broken through the enemy they will break up into individual shock groups (of about the strength of a platoon) and move against the hostile strong points, saturate these with their fire (approaching either from the flank or rear). They may then engage some antitank gun or perhaps hostile artillery, provided they are located between the village A and Z. Creek. Friendly aircraft will support these efforts. The tanks must move rapidly here and there firing on every target that appears until the infantry arrives. After the infantry arrives on Hill 120 the mission of the tank is accomplished and they asemble under cover southwest of Hill 120 and remain in readiness for the next mission. By following this procedure it will be impossible for the enemy to reappear in sufficient numbers to be a threat to the advancing infantry. Experience in war has demonstrated that even the best troops suffer in morale when they are compelled to face a hostile tank attack.

It is impossible to slow down the tank to the speed of the infantry except possibly at dusk, in darkness, or in fog.

B.—THE EMPLOYMENT OF A LIGHT TANK BATTALION IN AN ATTACK AGAINST AN ENEMY IN A PREPARED POSITION



SKETCH NO. 2

An attack is ordered along the entire Blue corps front to begin at dawn. The objective for the infantry is the line: K.Hill—Village E; that for the tank battalion the artillery position northeast of Hill 180.

The enemy has been preparing the position for several days. Smoke will be used only as a means of self-protection by the tanks. Hill 180 is of vital importance for the division sector. The 2d Division on the left of the 1st Division is using its tank battalion in conjunction with that of the 1st Division. The terrain in the left sector of the 1st Division is especially favorable for a tank attack. The tank assembly area is about 1,000 yards in rear of the line of departure. Blue had air superiority the day preceding the attack.

How will the infantry accompany the tanks in this situation? As soon as the leading tank wave crosses their line of

departure, which should be at dawn, the advanced infantry elements must follow them. It can be assumed that they will be able to keep pace in this manner until the hostile position is reached, provided they are not weighed down with packs.

It is assumed that the tank battalion has three companies in the front line, each company being divided into three waves. In this situation the small tanks will move out later, either following behind the waves or joining them. There being three waves of tanks that move through the infantry, it is hardly probable that the infantry will lose contact with them until the hostile main battle position has been crossed. In the meantime the tanks move around Hill 180 and endeavor to engage the hostile artillery. Naturally they will engage all targets that appear on their way to their artillery objective. In this manner they still assist their infantry even after contact with them has been lost. The situation does not become serious until the tanks have crossed Hill 180 and disappeared from view. At this time the enemy reappears in the picture.

This example differs from the former in that in the former one the tanks remained in sight on Hill 120; whereas in this example they move on to engage the artillery to provide a means for a breakthrough. The infantry should not "hit the ground" as soon as the tanks disappear but should advance rapidly. The infantry cannot expect any respite until their tanks have silenced the hostile artillery. This may take some time. Is there any other solution? Can the last tank wave be instructed not to cross over Hill 180 but to assist the infantry in capturing the hill? To do this would constitute the greatest error possible, that of dividing the tank forces. This may end in the two leading tank waves being too weak to subdue the hostile artillery and the third wave too weak to overpower Hill 180 until the infantry arrives.

Several solutions to the problem are offered:

(1) After the tank penetration succeeds against the hostile artillery, then part of them should turn about and assist the infantry in their advance. This solution has very weak points because the returning tanks have a panicky effect on their own infantry who would gain the impression that the tanks had been defeated. In addition, this turning about is not sound or simple because the tank units will be intermingled and must assemble and reorganize before they can undertake another mission.

(2) The tanks should not move out simultaneously with the infantry but should start their advance when the infantry has reached and is fighting for possession of Hill 180 as this mission is the most difficult one the infantry has. This solution is in accordance with World War experience where often the decisive fighting was not in penetrating the enemy lines but in the deeper zones.

(3) Tanks can enter the fight even later on; that is, when their own artillery is displacing forward and when the infantry has passed over Hill 180 and is engaged in the fight, to take the line: Hill K—Village E.

The deduction which can be derived from the foregoing three suggested solutions is that tanks must go into action at the opportune time when they can help their infantry over its most critical task. This time depends on each situation.

A fourth solution is suggested; that is, the employment of two tank battalions in the sector of the 1st Division. The first battalion moves out as originally stated, having the hostile artillery as its objective. The 2d Battalion would have Hill 180 as its objective. The infantry would be carried almost up to Hill 180 by the 1st Tank Battalion and in about two hours, or when it can be seen that the infantry is fighting for possession of Hill 180, the 2d Tank Battalion can be employed to carry the infantry over the last 200 yards. This is a good solution if possession of hill 180 is a vital corps objective but it will deprive the other regiments of tank support for their advance.

An attack of this nature calling for cooperation between tanks and infantry can be very difficult, especially if the direction of the attack changes and crosses the adjacent regiment's sector, because tanks are not tied down by sector boundaries.

Unfortunately, students of tank tactics have but limited experience to draw from. The British possibly are the exception, having the experiences of their 1934 tank maneuvers, but they, too, are groping in the dark for solutions.

Tank tactics which were correct during the war may now be erroneous. Without question the tank will achieve much in the next war for only the tank can combat the powerful fire-power of the hostile infantry.

The antitank weapons are being given great publicity, but assuming that a hundred tanks are used in an attack and

thirty are destroyed, seventy would still be left to carry out the breakthrough mission.

THE FRENCH MANEUVERS IN SEPTEMBER 1935

By Major G.J. Braun, Infantry

Motorized and mechanized units in varying numbers have participated in the French maneuvers of recent years. During the past two years these units have been consolidated and organized into and trained as divisions. However, not until the September 1935 maneuvers held in the Champagne have these large units participated as such in maneuvers.

The situation assumed for the maneuver was purposely made simple to enable those conducting it to test the technical and tactical problems rather than to arrive at definite conclusions.

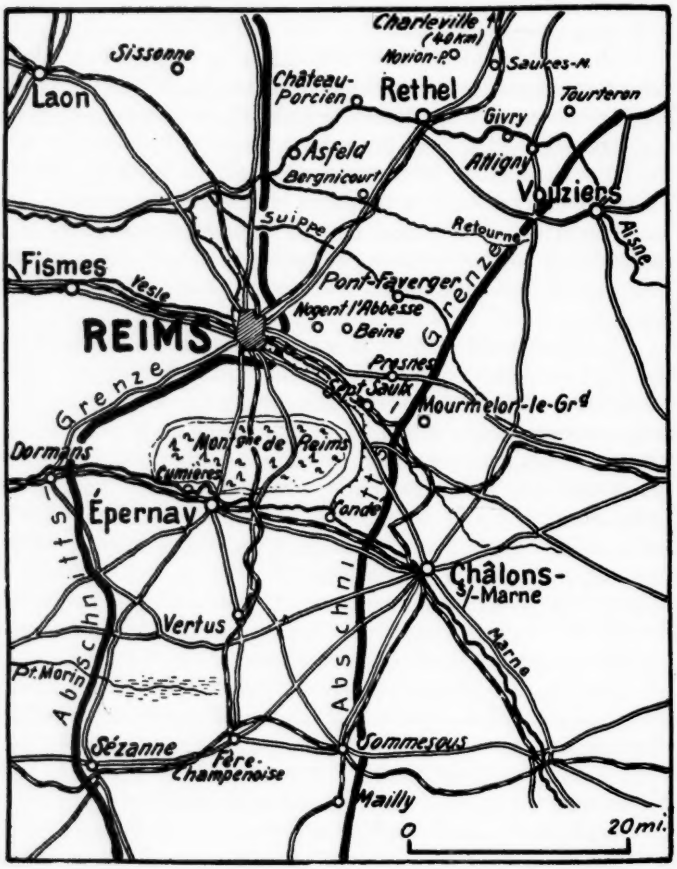
The Red (north) situation was as follows: On 2 September, the Red motorized 3d Infantry Division (consisting of 3 entrucked infantry regiments, one completely motorized division reconnaissance detachment, one light and one heavy motorized artillery regiment, one motorized engineer battalion, and one motorized communications detachment, etc.) broke through on a wide front, coming from the vicinity north of Rethel and moving south as far as the Marne. Due to a superior hostile opposition the division was compelled to withdraw under rear guard action toward the Aisne River. French newspapers stated this was a surprise breakthrough over the border at the declaration of war.

Blue (south) situation: The motorized VI Corps, consisting of 3 light mechanized divisions, 12 motorized infantry divisions and an assumed division, were concentrated in the camp Mailly and west thereof. It received orders to cross the Marne and the Aisne in the direction of Rethel—Charleville on 2 September, and drive back the enemy in that vicinity.

Attached aviation: The VI Corps, as well as all Blue or Red divisions, had one observation flight attached. In addition the umpires attached more than 5 groups of the latest bombers, 2 pursuit groups and one autogiro flight, according to their judgment, to one of the two opponents, but mostly against the stronger motorized units of the Blue forces.

Abstracted from *Militär-Wochenblatt*, 25 November 1935. "Die französischen Manöver motorisierter Verbände in der Champagne im September 1935."

The movements of the opposing forces were limited to an area 19 to 25 miles wide and 75 miles long. (See Sketch) They were not permitted to move laterally out of the zone for any operative or tactical reasons. The terrain was chosen



because of the difficulties it offered the mechanized forces. The motorized VI Corps on its route had to cross the Marne, Vesle, Retourne and finally the Aisne Rivers.

The maneuver lasted from 2 to 7 September and was divided into two phases: the first from the afternoon of 2 September to noon of 4 September, and the second from the afternoon of 5 September to the afternoon of 7 September.

During the phases the maneuvers were carried out day and night, without interruption. Throughout the maneuver the Blue VI Corps set the pace. The northern (Red) force found itself more the hunted enemy.

The weather offered an unusual opportunity in this experimental maneuver, being warm and dry for the first phase favoring the aviation and motorized elements, and rainy and overcast for the second phase, being very unfavorable for the air force and motorized elements.

A total of 30,000 men participated, utilizing 5,500 motor vehicles of which 2,200 were tanks belonging to the light mechanized division.

CONDUCT OF THE FIRST PHASE OF THE MANEUVERS

Upon receipt of information of the concentration and advance of the Blue VI Corps, the commander of the Red motorized 3d Infantry Division held the bulk of his forces on the Vesle and had them take up a position between Reims (exclusive) and Mourmelon le Grand (exclusive), behind the double obstacle formed by the river and the canal. Only a reinforced infantry regiment was moved forward as far as the south edge of Montagne de Reims from which place it in turn sent out security detachments, some of which included armored cars, as far as the Marne River. All Marne bridges from Epernay (inclusive) to Chalons sur Marne (exclusive) were destroyed. The width of the main position occupied was 16 miles and that of the outpost line, 19 miles.

At 3:00 PM, 2 September, the Blue light mechanized division moved in two columns toward the Marne. The reconnaissance detachments, composed of armored cars, motorcycle riflemen, dragoons on trucks and several light field pieces supported by the observation aviation, soon discovered the destruction of the Marne bridges. Not until late in the afternoon did they discover a crossing at Cumieres, northwest of Epernay. Before darkness set in the advance guard established a bridgehead at this point, overcoming what little hostile opposition was offered at this point. The main body of the light mechanized force remained south of the Marne in the vicinity of their roads of approach awaiting darkness.

During the night, 2-3 September, the entire Blue light mechanized division crossed the Marne at Cumieres. After crossing, the division again divided into two columns and continued the advance through the Montagne de Reims

toward the Vesle River. The hostile outposts offered very little resistance and systematically withdrew toward the Vesle River.

At dusk, the Blue motorized 12th Infantry Division entrucked at its camp at Mailly, and utilizing the protection furnished by the light mechanized division, moved in two columns in a night march toward the Marne. Previously dispatched engineers had repaired the bridge at Conde which was utilized by the right column of the Blue motorized 12th Infantry Division while the left column used that at Cumieres for its crossing. By 7:00 AM, 3 September, the advanced units of the Blue motorized 12th Infantry Division had detrucked east of Montagne de Reims and were moving toward the Vesle on foot. This division now took over the right half of the sector on the Vesle. It had been subjected to numerous bombing attacks since its crossing over the Marne had to be carried out in daylight.

Reconnaissance patrols were sent out all along the Vesle front by the Blue motorized 12th Infantry Division and the Blue light mechanized division on 3 September. These continued until late in the afternoon. Based on the information received from these reconnaissance groups, the commander of the Blue VI Corps realized that only an organized attack by both divisions could insure success. It was immediately evident that the light mechanized division lacked the combat strength to force the crossing alone; therefore the remainder of the day was devoted to concentration of both divisions.

The mounted 1st Spahi Brigade (composed of 2 Spahi regiments and light artillery) was now made available as reinforcements to the Red commander who immediately utilized them in his front lines.

Daybreak of 4 September found the Blue VI Corps (less the 3d Division) prepared to attack over the Vesle with its main effort by the 12th Infantry Division. The canal and the creek were crossed by using pneumatic rafts and other available material. The attack on the far side of the Vesle progressed systematically. By 10:00 AM the Blues occupied all the strips of woods between Prosnes and Nogent l'Abbesse despite energetic efforts by the Red air force to slow them down or stop them. It is worth mentioning that the Red 3d Infantry Division was forced to abandon its positions in some of the old war-time trenches, which it had occupied, due to the effect of gas (ruling of umpires) and was forced to

move back to another position when at 12:00 noon the first phase of the maneuver ended.

Having been on the move day and night in the open, the troops rested in billets on 5 September.

Conduct of the Second Phase of the Maneuvers

The second phase started at 2:00 PM, 5 September. The general situation was continued with the Blue motorized VI Corps receiving instructions to drive the Red motorized 3d Infantry Division over the Aisne toward Charleville. There were slight changes in the situation of both sides at the beginning of the second phase; for example, the Red motorized 3d Infantry Division was directed to move its main forces behind the Aisne with the mission to hold the line: Chateau-Porcien—Attigny. Rear guards, including the Red 1st Spahi Brigade, were instructed to conduct a delaying action against the enemy from the Suippe as long as possible.

At the resumption of the maneuvers the Blue motorized VI Corps was to be in position of readiness for immediate advance from a line: Prosnes to northwest of Nogent l'Abbesse, having its motorized 12th Infantry Division on the right and the light mechanized division on the left. Reconnaissance detachments had been pushed forward as far as the Suippe. As in the first phase, the Blue commander utilized the light mechanized division for reconnaissance to drive back the hostile outposts against their main combat line. The execution of the decisive blow was again the function of the Blue motorized 12th Infantry Division.

The afternoon of 5 September was taken up with sporadic fighting and by evening the situation was as follows: the Blue right flank had moved forward 19 miles and had about reached the Aisne east of Rethel, but the left flank was stopped at Bergincourt on the Retourne by resistance of the hostile motorized infantry and artillery of the reinforced Spahi Brigade. Fortunately for the Blues, the Reds withdrew their rear guard over the Aisne after darkness set in so that it was possible that the western half, which was the sector of the light mechanized division, could be moved up to the Aisne that night. The Reds then destroyed the Aisne bridges.

Benefiting by the experience in the first phase, the Blue motorized 12th Infantry Division entrucked at Prosnes and moved toward the Aisne during the night, 5-6 September, at

8:00 PM. About 3:00 AM of 6 September, its advanced units were detrucked southwest of Attigny and immediately moved forward to the Aisne.

Reconnaissance activities consumed most of 6 September and it was again decided that it would require both Blue divisions plus all their combat means, especially the infantry and artillery of the motorized 12th Infantry Division, to overcome the hostile positions. This time the motorized 12th Infantry Division was able to establish a bridgehead at Givry and one east of Attigny and hold them. Two bridges were immediately constructed.

By 7 September the motorized 12th Infantry Division had crossed the Aisne and was prepared to resume the attack from the bridgehead. On its left flank at Givry the Blue light mechanized division also crossed the stream. At 7:00 AM, both divisions in cooperation forged ahead toward the north. West of Rethel the hostile resistance was weak. A heavy fog favored the advance of the Blue VI Corps until 9:00 AM. The enemy was driven back without great effort and as soon as it was discovered that they were withdrawing, the Blue light mechanized division was ordered to pursue. The enemy held one more position along the line: Novion Porcien—Saulces Mondin—Tourteron. At 12:00 noon the Reds carried out a successful surprise massed counterattack by a battalion of the new Class D tanks. The fight ended in a series of isolated fights in which the tanks, despite their lack of speed but due to their heavy armor, maintained their superiority. At 1:30 PM, the maneuver ended.

Some important lessons were derived from the maneuver and much could be criticized. In both phases, the light mechanized division was used as a cavalry division, for reconnaissance, security and pursuit, and it required the motorized infantry division to carry the decisive action. The light mechanized division is better suited to break through a weak hostile outpost line or to penetrate deep against the unprotected hostile flank but not in an organized frontal attack. Its ability was also greater since it functioned only against weak artillery forces.

Another experience of the maneuver was that the aviation could not locate the mechanized division in average visibility. It should have been able to see them 12 to 18 miles away, or from 3,000 to 4,000 yards elevation.

It was assumed that the 25-mm. antitank guns were very effective and an increase of these is anticipated.

The question as to the best means of communication for moving and fighting motorized units came up. The telephone naturally was only good for infantry in attack or for artillery in position. On the march the wireless served best. Use of the code caused quite a loss of time so that in most cases the motorcycle messenger served the purpose better.

The superiority of the D type tank over the armored vehicles was especially noticeable and showed that the armored car was not suited for combat where tanks or artillery can be anticipated.

The conduct of the maneuver demonstrated that the French Army possessed a great mobility in its use of larger motorized and mechanized units. It was especially interesting to see two motorized divisions function with a mechanized division.

CONCLUSIONS BASED ON THE FRENCH MANEUVERS, 1935*

By Major G.J. Braun, Infantry

The French maneuvers of 1935 provided food for thought.

The Blue force, which was twice the strength of the Reds and had about 3,800 vehicles available, required 12 hours to move 37 miles which included the time for entrucking and detrucking. It is interesting to note that modern cavalry can cover this same distance in 10 to 11 hours without undue fatigue.

The reconnaissance detachment which preceded the light mechanized division demonstrated the advantage of rapid reconnaissance when they discovered the destroyed Marne bridges and located a crossing at Cremieres.

Upon receipt of the information of the strong concentration of the Blues, the Red commander kept his main forces beyond the Vesle and the canal in order to utilize this strong natural obstacle for his defense. He sent a third of his infantry, motorized artillery, and engineers to the south edge of the Montagne de Reims to the Marne to outpost his position and destroy bridges. The Reds failed to utilize the speed of their

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Asbtracted from *Militär-Wochenblatt*, 11 February 1936. "Etwas über die französischen Manöver der mot. Verbände im September 1935," by Captain Gerhard.

*See also, "The French Maneuvers in September 1935," page 61. Abstracted from *Militär-Wochenblatt*, 25 November 1935

motorized units because the Blue advance guard was able to establish a bridgehead prior to darkness without having met any real opposition. This simplified the Blue task by practically giving them the crossing at Cumières. Proper use of the demolition units, or where such were not available, the use of combat speed and mobility of the Red units, might have ended the maneuver differently.

It seemed rather unusual that the strong Red air attacks were not credited with any successes during all the maneuvering by the Blue forces between the Marne and the Vesle. When the maneuver was resumed, at the beginning of the second phase, the Reds were moved behind the Aisne, which gave the impression that motorized units lacked strength to defend. Again the light mechanized division had unusual luck and had forged ahead 18 miles farther than the motorized 12th Division. The Reds gave up the Retourne crossings and withdrew all their forces behind the Aisne. An energetic opponent could have defeated those parts of the mechanized division east of Rethel and at Bergincourt in detail because the Blues would have been unable to coordinate their movements due to the 10 miles (air distance) separating these forces.

The motorized 12th Division required 7 hours to cover the distance of 27 miles between Prosnes and the vicinity of Attigny (entrucking time included). It is certain the horse cavalry and motorcycle units could have done as well.

The maneuver itself suggested that:

(1) Motorized reconnaissance units are best suited for distant reconnaissance.

(2) The umpires' decisions in the tank attack against the armored cars would perhaps be borne out in actual war.

(3) During favorable flying weather it is best to conduct troop movements at night.

(4) The defense did not utilize to the utmost the potential defensive possibilities of the excellent terrain.

(5) Mobility was lacking on both sides. Future maneuvers will show whether this was due to the fact that the columns were roadbound or due to faulty leadership. Even the light mechanized division moved and stopped continuously.

(6) Missions such as given the motorized units in this maneuver were hardly appropriate for them. Motorized reconnaissance units in conjunction with horse cavalry, motorcycle units and motorized artillery, could better solve these

missions, as their speed would suffice and their handling would be more elastic.

(7) It would be advantageous to study the Russian experiences where motorized troops cooperated with horse cavalry.

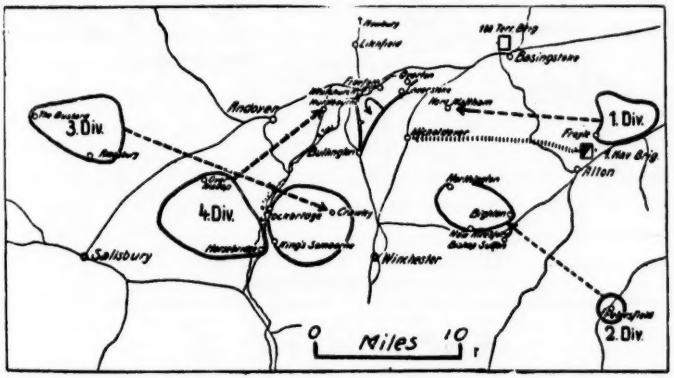
(8) The great advantage in that motorized troops will be less fatigued when they meet the enemy will be reduced during war conditions when they will be tied down to roads which are susceptible to air attacks.

(9) It is essential that, in addition to "fast divisions," there be "mobile divisions." Under actual warfare speed in itself would soon be blocked out but not mobility.

THE BRITISH ARMY MANEUVERS

By Major F. During, Infantry

The British Army maneuvers took place in September 1935, between the I Corps (Blue) and the II Corps (Red).

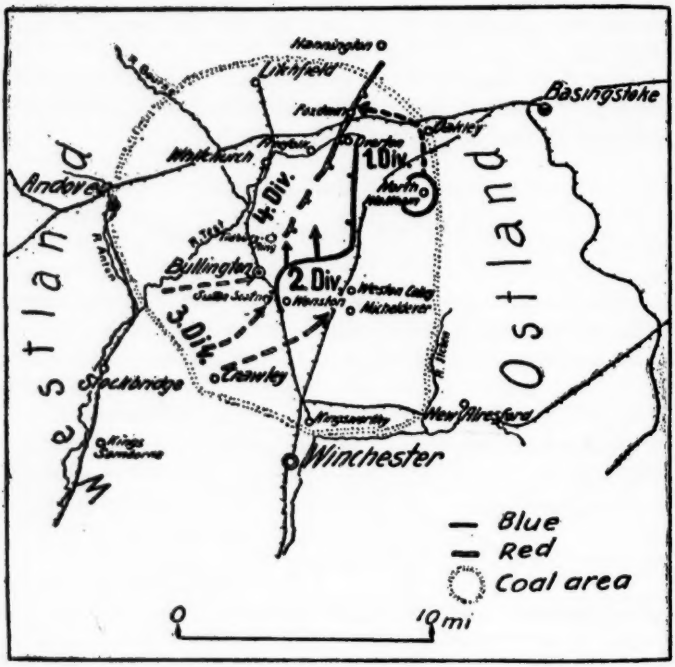


SKETCH NO. 1 — Blue = Red

The Blue I Corps (East) consisted of the 1st and 2d Divisions, one cavalry brigade, 2 tank battalions, and 4 squadrons of aviation. The Red II Corps (West) consisted of the 3d and 4th Divisions (less one brigade), 2 tank battalions and 4 squadrons of aviation. Besides having one more infantry

Abstracted from *Militär-Wochenblatt*, 11 November 1935. "Die englischen Armeemanöver."

brigade, Blue also had two more motorized battalions of field artillery than Red. The general situation was that a large area rich in coal was desired by two states (East and West). Peaceful negotiations have failed and both states prepared for an advance into this area. War was declared at 2:00 PM, 17 September.



SKETCH NO. 2

The weather was very unfavorable, and due to a heavy storm the hour of advance was changed from 8:00 PM to 2:00 PM, 17 September. The order for this change reached the divisions, especially the Blue 2d Division, rather late, but immediately upon receipt of the order each division started its advance. Both sides had the mission to secure the crossings over the River Test, using for this purpose light armored cars and motorized reconnaissance detachments. Due to the fact that the River Test ran from the southwest to the northeast, it was natural that Blue was able to occupy

the important crossing at Whitchurch, while Red occupied the crossing south thereof. The Blue 1st Division had the mission to march on Whitchurch, while the Blue 2d Division was to march on Bishop Sutton. The Blue cavalry brigade was to protect the left flank of the 1st Division.

The Red 4th Division was ordered to march on Andover, the Red 3d Division on Crawley. Contact was made between the advanced elements of the Red 4th Division and units of a Blue brigade west of Whitchurch at 6:00 PM. This brigade had been held up in its advance by Red bombing attacks. The Blue 2d and Red 3d Divisions reached their respective objectives. At the end of the first day the Reds had the advantage.

The Red 4th Division continued its attack during the night, 17-18 September. Its 11th Infantry Brigade, two battalions of which had been transported from Andover by motor, took Whitchurch. The Red 10th Brigade advanced to the Whitchurch—Sutton Scotney road. After Whitchurch was taken, the two battalions of the 11th Infantry Brigade were sent by motor to the north flank and took Freefolk. The Blue 1st Division now withdrew to a line running south from Overton. (See Sketch No. 2)

Blue, over-estimating the strength of the opposing troops, believed that the Red 3d Division was on the north and would make an enveloping attack against the Blue right flank; therefore all available Blue reserves were ordered to North Waltham. It was Blue's intention to draw the mass of the Red troops in front of its 1st Division in order to have the Blue 2d Division attack the Red position from the south and roll it up. But the Red 4th Division did not follow the Blue 1st Division; in fact, Red did not know that Blue had withdrawn so far to the rear. Therefore, a Red attack which was intended against the Blue flank, met the Blue front and was unsuccessful on the north. In the south advantages were gained, but at 8:00 PM the attack was stopped all along the line.

At the end of the second day of the maneuver, Blue occupied a strong position on the heights east of Overton extending south and west to Tidbury Ring. On the south flank each side had a division in readiness with which to bring about a decision by a flank attack. The commander of the Blue forces was in ignorance of the location of the Red 3d Division, but he thought that on account of the

advanced location of the Red troops opposite the Blue 1st Division, an attack by the Blue 2d Division in a northwesterly direction towards Freefolk—Whitchurch was opportune.

This division prepared for the attack during the night and at 6:30 AM, 19 September, the 4th and 5th Infantry Brigades attacked with the right flank at Micheldever, the 6th Infantry Brigade (motorized) was echelonned to the left rear. The attack was supported by the division and the mass of the corps artillery. Each attacking brigade has a tank company attached. The Blue 1st Cavalry Brigade secured the left flank. At the beginning the attack was successful; the 12th and 10th Brigades of the Red 4th Division were forced to withdraw. However, as soon as the Red commanding general received the report that the Blue 2d Division advanced along the entire Red front and that its left flank was unprotected, he decided to counterattack in a northeasterly direction against the rear and flank of the Blue 2d Division. He ordered the Red 7th Brigade to attack in the direction of Bullington, the Red 9th Brigade in the direction of Sutton-Scotney, and the Red 8th Brigade with the tank battalion in the direction of Weston Colley. The Blue 6th Brigade tried to stop this counterattack, but was unsuccessful. The Blue 4th Tank Battalion was now ordered to attack the Red 8th Brigade in flank and rear. This attack promised success, but the Red 5th Tank Battalion, which had been kept in reserve, successfully attacked the Blue tank battalion and was able to advance in rear of the Blue Corps. Blue decided to withdraw when the maneuver was called off.

The wooded terrain and inclement weather made the action of aviation difficult; in addition, the troops were well trained in taking cover against aircraft. Red aviation was superior to Blue regarding reconnaissance. Troop movements of Blue were constantly observed, while Blue planes were unable to detect Red troop movements at night. The success of Red, even though numerically inferior, was due to better leadership, and faulty air reconnaissance.

THE INFANTRY TANK

Experiences Based on the British Maneuvers, 1935

By Major G.J. Braun, Infantry

Correct and incorrect methods of tank employment can be derived from the British experiences in their September 1935 maneuvers. The exercises were conducted by the Aldershot authorities over typical English terrain, which is hilly with small fenced-in fields and numerous hedges favorable for infantry but unfavorable for tanks.

The situation called for a rapid advance of one division with an opposing division trying to delay the advance as long as possible. The attacking force (Blue 2d Division) consisted of two experimental infantry brigades and two tank battalions to be used as infantry tanks. The Red 1st Division had sufficient time to occupy its position prior to contact. Its position was approximately 6,000 yards wide and 500 yards deep. While the defense was suitable against a frontal attack, it was over-extended for a tank defense, having only 48 antitank guns.

Mines were used to augment the defense but each brigade possessed only 400 mines. These could provide security for only 100 yards frontage. Tanks could attack from any direction. The defender had no knowledge as to the direction from which the tank attack would come; therefore the position was organized satisfactorily only against a frontal attack.

The Blue 2d Division gained contact with the two advanced battalions of the Reds. The Blue cavalry (reconnaissance force) failed to secure any other information than that which was obtained during the attack. This mounted force was not suitable for modern warfare. It was estimated that the entire 1st Division was opposing them instead of two Red battalions. The commander of the Blue 2d Division decided to hurry the attack to gain time, using both brigades for this. The position occupied by the two Red battalions was suitable to hold off the Blues for some time.

Here was an opportunity to utilize tanks because of their invulnerability to machine-gun fire and of the possibility that they could discover the true strength of the defender. Both Blue brigade commanders wanted the tanks to be assigned to them but the division commander refused and

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Abstracted from *Militär-Wochenblatt*, 25 December 1935. "Der Infanterie-Kampfwagen. Erfahrungen aus den diesjährigen englischen Manövern."

reserved them for his decisive blow. He believed his forces insufficient to accomplish their mission. His delay in using the tanks, for fear of losing a few, prolonged the attack considerably.

In reality it is doubtful if the Blue attack without the help of tanks could have succeeded. It gained merely 1,000 yards of ground the first day. Apparently the division organization was faulty, and poor tactical methods were used since the normal supporting weapons of the division were insufficient to support the attack. The infantry attack succeeded under protection of smoke placed by the artillery. This required most of the available smoke ammunition, leaving none in the event that the attackers should be forced to assume the defensive.

The attack was to be resumed the following day at dawn. Tanks require more light in order to permit vision through the armor slits. The infantry wanted to utilize the early light to restrict hostile observation of their movements. It also wanted a dense barrage to precede them so that they could overrun the hostile position before the hostile artillery and machine guns could reply. The tanks wanted smoke to hide their movements. Infantry wanted to fight on terrain best suited to them, which in turn was unsuitable for tank movements.

Finally the tanks were used and succeeded in utilizing terrain favorable to them and moved forward under artillery support. A smoke screen was put down but unfavorable wind carried the smoke behind the antitank weapons with the result that 10 out of 18 tanks were adjudged destroyed in one sector, and 4 out of 6 in the other. The infantry losses were very heavy since the hostile machine guns had not been destroyed or neutralized.

For the second attack the defense had carefully anticipated the route of the attacking tanks and concentrated the fire of six batteries on them for two minutes, then raised it on the attacking infantry.

On the left flank an infantry brigade attacked without tank support and failed to gain its objective. The Blue division commander had only used two companies out of his two battalions.

From this maneuver it can be seen that different types of artillery support are required by infantry and tanks; one wants a barrage, the other smoke. Their artillery requirements can

not be met simultaneously. The questions of light, terrain, etc., suitable for each arm, are in direct conflict with each other and may become disadvantageous to each or both. A combined infantry and tank attack must of necessity be either frontal or flank and in either case sacrifices the moral and physical advantages of an independent tank attack. It is difficult to combine armored and unarmored forces for an attack. The situation might have been solved better had a massed tank attack been made against the hostile main position or had the tanks been employed to capture the advanced positions only.

The conclusions arrived at from this and previous maneuvers rather conclusively indicate that a combined infantry and tank attack is an error.

[NOTE: The maneuvers between the 1st and 2d Divisions were held prior to the maneuvers of the I and II Corps. See page 69.—*Editor.*]

WOODS IN THE DEFENSIVE

By Captain Wendell G. Johnson, Infantry

For the defense, woods present desired advantages. Under their cover, aviation is practically powerless. They constitute a non-traversable obstacle for armored vehicles. Cavalry can only fight on foot within woods; and artillery, prevented from having observation, loses most of its effect.

For the attacker, it is a difficult objective to carry. If he succeeds in establishing himself at the edges, his advance within the woods will be slow, uncertain, strewn with ambuscades, and without opportunities for worthwhile supporting fires.

It is advisable, therefore, to build up the defense on woods. But how? Should the main line of resistance be at the edge, within, in rear of, or in front of the woods?

DEFENSE AT THE EDGE

The placing of the line of resistance at the edge of the woods offers many advantages. It enables the defender to employ in front of his position a dense barrage which is desired for every good defensive system; also to utilize completely the obstacle against tank operations; and to facilitate supply and evacuation up to the most advanced lines as well as the movements of reserve units.

Abstracted from *Revue d'Infanterie*, October 1935. "Les bois dans la defensive," by Captain Kirchmayer

These advantages are indeed inviting. They are, however, overbalanced by grave disadvantages. The emplacing of the line of resistance at the edge of the woods obliges the defender to concentrate the greater part of his means of the infantry fire, as well as his system of observation, at the extremely vulnerable edge of the woods. A division attacking with only its organic means on a normal front of about 2 miles could readily neutralize all of these weapons crowded on a single terrain feature so readily distinguishable.

While the cover of the woods gives infantry reserves a good opportunity for carrying out their missions of reinforcing the main line of resistance, it renders the execution of counterattack missions extremely difficult.

A counterattack within a woods is a delicate operation, for it can not count on effective supporting fire. Its success is indeed doubtful.

In view of these serious disadvantages—certain neutralization of the majority of the fire-power and weakening of reserves—the placing of the principal line of resistance at the very edge of woods should usually be avoided.

Defense Within the Woods

Defense within the woods renders the operation of hostile tanks absolutely ineffective and therein lies its principal value.

It places the defender, however, in such a position that none of the fundamental rules for a good defense can be carried out. The conditions for fire are unfavorable and if the use of the forest paths makes the creation of a barrage of fire tactically possible, this barrage will be without depth and, therefore, of little value. Observation is difficult, has no depth, and a surprise action by the enemy is always to be feared. Artillery support is poor. The intervention of reserves to counterattack is of little value owing to the impossibility of giving them good fire support.

Let us add to that, that a defense within the woods requires more men on account of the poor fields of fire. It is, therefore, a poor procedure which does not uphold the principle of economy of force in the defensive. It is advisable not to have recourse to such a system except in case of absolute necessity.

Defense in Rear of Woods

The placing of the position of resistance behind a woods allows the denial of the exits to the enemy. The problem

presented to the defender in such a case will be relatively simple. It will amount to placing on the edge of the woods the concentration of all his means of fire, infantry and artillery.

But this scheme of defense implies the abandonment of the obstacle and all of the advantages which it offers, particularly for the stopping of armored vehicles.

It offers, moreover, the disadvantage of giving to the attacker an advantageous base of departure, for he can freely concentrate all his attacking agencies, and it places the defender under the constant menace of a surprise attack from the woods. Lastly, it necessitates strong agencies of fire in order to place sufficiently strong concentrations on the edge of the woods to prevent the hostile exodus.

This is, therefore, a dangerous scheme. Instead of holding the edges under the fire of the main line of resistance, it would be better to withdraw well to the rear of the woods so that only the artillery would actually fire on the edge while the infantry echelonned its fires in depth between the edge of the woods and the line of resistance.

Defense in Front of the Woods

A position of resistance pushed partly or entirely in front of the woods enables the defender to retain the greater part of the advantages and to eliminate a certain number of disadvantages of defense at the very edge. It allows the establishment of a barrage of fire by echelonning the weapons in depth and thus avoids the accumulation of fire-power at the edge.

The movements of reserves can still benefit from the cover of the woods. Counterattacks on the main line of resistance are made easier where they can benefit simultaneously from supporting fires and from the excellent line of departure formed by the edge of the woods.

Supply and evacuation in rear of the line of resistance can also be carried out under good conditions.

Lastly, the existence of woods within the area of resistance blocks the advance of the attacker. It imposes two distinct phases on his attack. First, to carry the edges of the woods and then to advance within the woods to reach the artillery positions. The operations of the second phase require a regrouping of the attacking forces and an alteration in the formations which will involve rather long delays and thus break up the force of the attack, reduce its effectiveness, and put it at the mercy of a dangerous counterattack.

Certainly, in such a scheme of defense the obstacle is not utilized fully against attacking tanks. This is a disadvantage. However, the action of tanks will not be as effective or decisive as it could be if it were to simultaneously strike the entire defensive installation, that is, the line of resistance, the reserves, and the artillery at the same time. Yet, by placing the main position of resistance partially or totally in front of the woods, the artillery positions and the reserve positions are concealed. As a result it is only necessary to work out a defense against combat vehicles for the main defensive position. This is a problem which modern infantry should be able to solve even more readily as long as the artillery will always remain in a position to operate to its benefit.

For these different reasons the defensive employment of woods, by placing the main position astride or in front of the edge of woods, is preferable.

Of course, definite conclusions can not be drawn from this study. In the realm of tactics and especially in a defensive problem, the terrain always plays a tremendous part which often disrupts the most inviting theoretical ideas. It must be recognized, however, that the line of reasoning is basically sound and therein lies the best eulogy that it can be given.

CAVALRY IN MOUNTAIN WARFARE

By Captain R.B. McClure, Infantry

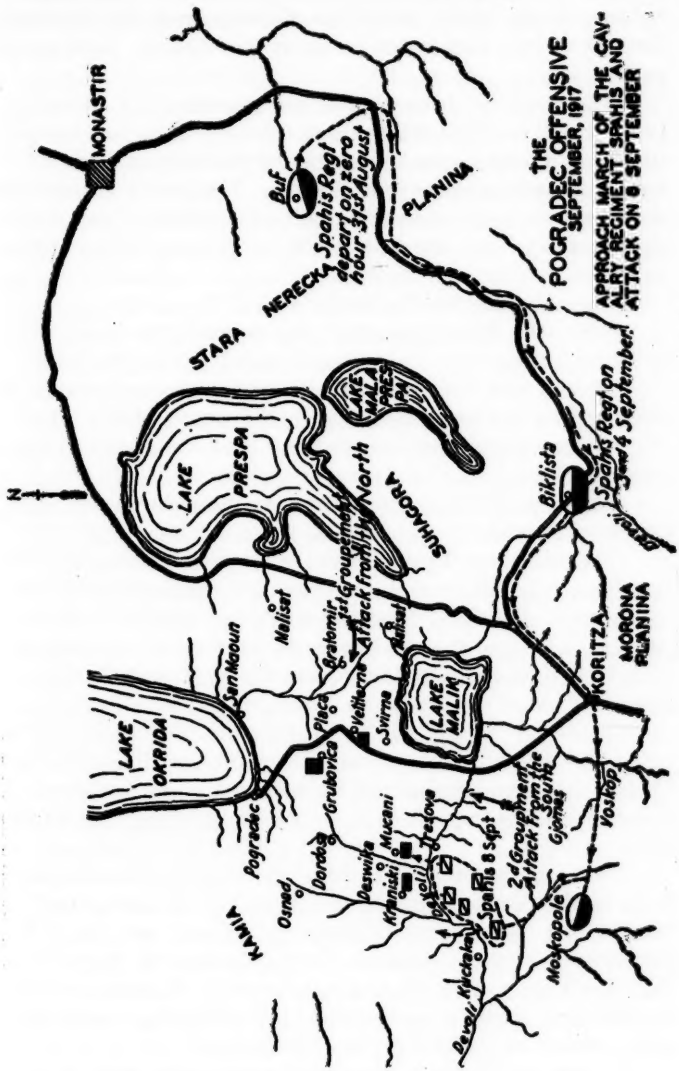
The Pogradec Offensive, September 1917

The operations in Albania, called the "Pogradec Offensive," in September 1917, had as a setting a mass of mountains, somewhat hidden, situated between Lake Okrida and Lake Malik and the high valleys of the Kelizoni, Devoli, and the Selce.

This group of mountains consists of several chains of mountains ranging in height from 1,500 to 2,000 yards. The chaotic nature of the terrain, the abrupt cuts made by the valleys and walls of rock made all troop movements very difficult. The road system was rough and unimproved and consisted mostly of footpaths. It is very difficult in such irregular regions to hold and fight against large numbers or to put powerful artillery into action.

Abstracted from *Revue de Cavalerie*, July-August 1935. "La cavalerie dans les opérations de montagne."

The defensive system of the enemy, on the Macedonian Front, ended southeast of Lake Malik, at Gradiste. From



this point to the Adriatic, the Austro-Hungarians, due to the terrain, did not believe any offensive action on the part of

the French possible and had organized only a system of advance posts supported by a few pieces of artillery.

On the other hand, the enemy's defensive organization between Lake Malik and Lake Okrida, from the Gradiste, through Svirna, Gubrovica as far as San Maoun, faced to the east.

The result of these dispositions was that if a strong surprise attack could pierce the outpost line, there was the possibility of a deep advance without the necessity of flank movements or reinforcements from the rear. The Austro-Hungarians thought a surprise impossible due to the Albanian spy system and studies of the situation made by German officers which had been put at their disposal.

The objective for the attack was:

First, the envelopment of the center, the enemy base at Pogradec, between Lake Okrida and Lake Malik; and

Second, the clearance of the immediate approaches to Pogradec on the north and east in the region of the lakes.

A provisional division divided into two groups made two attacks.

The principal attack was from south of the Devoli River direct on Pogradec.

The other from Bratomir was to locate the advance enemy positions near Placa and fix them in position facing east. Then when the attack from the south had reached a position parallel to Svirna, the two groups would launch a coordinated attack on Veliterna, Grubovica, and the heights of the frontier which protected the route to Pogradec.

These two attacks, in order to reach Pogradec, had to secure, by hard fighting, a series of successive lines, strongly held in force and supported by artillery of all calibers. It was impossible to approach them without the enemy's knowledge.

The enemy counterattacked, and crossed the Devoli, a little to the north of its junction with the Kelizoni, to get a foothold on the heights between the Devoli and the Selce, since the line of the crest of Kamia dominated Pogradec to the northwest. This pushed the enemy's defensive system to the west, thereby preventing an outflanking movement, and a threat on its lines of communications.

A new attack must therefore be associated with that of the south group. To assure its success it was necessary to keep the enemy in complete ignorance up to H hour, so as

to take advantage from the beginning of an absolute surprise and avoid any modifications in enemy dispositions and to let him believe that all French preparations in the Koritza area were aimed solely at the Gradiste and the positions of Grubovica.

French headquarters had to find the way and means of putting the following group in position for an important maneuver without arousing enemy suspicions:

The Spahis cavalry regiment (five squadrons and one machine-gun company). (Note: In 1918 machine-gun units in a cavalry regiment were called companies.)

The 49th Battalion of Senegalese riflemen (3 companies and a machine-gun company).

A detachment of Albanian gendarmes (1 company).

1 battery of mountain guns (65-mm.).

1 detachment of T.S.F.

1 ambulance detachment.

The problem was even more delicate since, in addition to its spy system which covered the region, the enemy had an observation post at Gradiste, which never allowed a day to pass without reporting all traffic on the road from Biklista to Koritza, whether it was a soldier, rider or vehicle, with the aid of his powerful "Zeiss Marine" glass.

Moreover, enemy aviation based on Okrida was numerous, active and superior to the French and had every means at its disposal to inform its headquarters of the French movements.

The problem was solved in the following manner: The area of Moskopole was selected as the assembly zone of Colonel Forton's group. The 49th Senegalese battalion, the Albanian gendarmes and the artillery were already almost in their assigned positions. These units participated in the covering of Koritza along the Kelizoni and on the heights of Gynomas.

The Spahis cavalry was in rest camp to the northwest of Florina, near Buf, about 63 miles from Moskopole.

The Spahis left Buf on 31 August at 12:00 midnight and on 6 September were in concealed bivouacs, in dense pine woods where tents and horses were completely hidden from hostile aerial observation. The regiment was at hand for the attack fixed for daybreak on 8 September. Reconnaissances were made during daylight on the 7th.

During its approach march, the regiment of Spahis cavalry had been observed by hostile aviation on 3 and 4 September, in the vicinity of Biklista, where it halted for a day.

But from 5 September the enemy observers did not know what had become of them as they marched to Moskopole under cover of darkness into concealed bivouacs.

During the night of 7-8 September the camps at Moskopole were broken and the squadrons took up their positions for their departure.

Thus by a rapid displacement of more than 63 miles, where marching on foot and with horses were combined to cross the rough terrain, where the speed of infantry marches under the best conditions was only 1 or 2 miles an hour, 5 squadrons and one company of machine guns had been put in attack positions in five days without the enemy learning of their movements.

This group of cavalry constituted the bulk of an attack group charged with the mission of seizing a line of enemy posts about 1,500 yards high behind the Devoli.

Due to its mobility the cavalry was at its line of departure in time for the attack, a fresh body of troops holding the trump card of surprise in their hands.

On the morning of 8 September, the attack started. The attacking troops crossed the Devoli between Kuckaka and Tresova, and gained a foothold on the summits of Kraniski and Mukani.

The suddenness produced a complete surprise in the enemy lines, thus assuring success.

In the evening of 8 September, the cavalry spent the night with a march outpost a little north of Deswica and Mukani. Toward the end of 9 September, after marching echeloned in half-regiments and when the first half-regiment had swept over Osnad and the heights of the Dent, the Spahis camped to the northwest of Bragodja.

On the night of 10 September they were near Berdova, at the doors of Pogradec, and were masters of that city on 11 September.

Three days was sufficient time for the attack, which had penetrated to a depth of from 15 to 24 miles.

Three days of effort to advance rapidly in mountainous terrain, with steep and difficult climbing, without taking into account the special fatigue of combat or the difficulties of re-supply.

Such progress was possible due to the mobility of the horses.

The led horses which at first seemed so much dead weight and a handicap to the cavalry in mountain warfare, rendered

a priceless service. They made the Spahis regiment more mobile and permitted the solving of the supply problem.

It was not possible to live off the country, for the few poor Albanian villages of the region, pillaged, ransacked, and exploited by Albanian bands and Austro-Hungarian regulars, had nothing to give.

The horses were loaded with five days' ration for men and animals. These were the supplies upon which the squadrons subsisted until 12 September.

The groups of led horses consisted of from 6 to 8 horses, which were tied to rods, one in rear of the other, and thus marched in rear of the regiment; and in spite of some unavoidable incidents, they assured the supplementary mission of re-supply and mobility.

During the operations on Pogradec the regiment was called upon to fight only dismounted. It was engaged each day against infantry occupying naturally strong positions, covered by defensive works. The Albanian irregulars were well officered, disciplined, excellent shots, well-trained in mountain guerrilla warfare, fighting in liaison with Austro-Hungarian infantry which was perfectly equipped and well supplied with machine guns.

On 8 September, the Spahis cavalry which had forced a crossing of the Devoli, found Albanians and Austro-Hungarians on the right bank, on the dominating heights of the river entrenched in defensive works and protected by perpendicular cliffs of 1200 yards in height and bands of fire placed in front of the towns of Kranisti and Mukani. From daybreak until noon the Spahis seized the outposts, scaled the cliffs, took the towns by assault, and cleared the crests which separate the Devoli from the Selce.

On 9 September, the enemy unsuccessfully tried to retake the line along Dordosa-Osnad. He made a stubborn defense withdrawing from trench to trench and launched several counterattacks.

On 10 September the Spahis threw themselves against the defenses of Pogradec. The enemy, supported strongly by artillery, defended step by step. Its resistance was outflanked and trenches occupied one after another. The Spahis arrived at the outskirts of Pogradec and one squadron penetrated the village.

In the morning of 11 September the heights dominating Pogradec to the northeast were taken. One squadron which

had maintained its position in Pogradec during the night in spite of a violent grenade counterattack by the Saxons, assaulted at once a sugar loaf mountain which dominated the town on the north and closed the road to Lin.

The Spahis had to maneuver from the time resistance was first encountered. Automatic arms entered into play and made a curtain of fire which sheltered the maneuvering mass. This maneuver consisted in discovering the defiles which led to weak points in the enemy lines and infiltration to take hold of the heights where the enemy flanks and rear were menaced or taken in reverse.

The machine gunners played a large part. In direct attacks they took under fire the perceptible points of the hostile position and neutralized hostile machine guns. In outflanking movements they accompanied reconnaissance patrols and when the elements of maneuver had gone beyond the enemy flank, they fired against the enemy from flank or rear.

The rifle grenadiers crawling or climbing would hide in defiladed areas and bombard the defenders hidden behind bands of fire in their trenches.

Finally the offensive hand grenades served to seize the trenches and stop hostile counterattacks.

The tactical use of the machine-gun company consisted of never using it in mass, but by isolated sections and most generally by platoons. Mountain warfare demands this method of machine gun use.

Machine-gun sections should be echeloned in depth and a unit should be kept in reserve ready for firing. Thus other machine-gun sections can place the guns and equipment on pack animals and displace forward or to unpack and go into position farther to the rear, without loss of fire-support from the machine guns to the fighting line.

The Pogradec offensive shows the type of service cavalry can render in a mountainous country.

The operations assigned to the marching regiments of Spahis cavalry permitted a rapid displacement for the employment of attack elements and for the maneuver required. Their successes were due to their speed and mobility, distinctive qualities of cavalry. It had the benefit of surprise and the exploitation was energetically led.

THE INFLUENCE OF THE FORTRESSES OF LIEGE, NAMUR, MAUBEUGE AND ANTWERP ON THE GERMAN OPERATIONS IN 1914

By Major G.J. Braun, Infantry

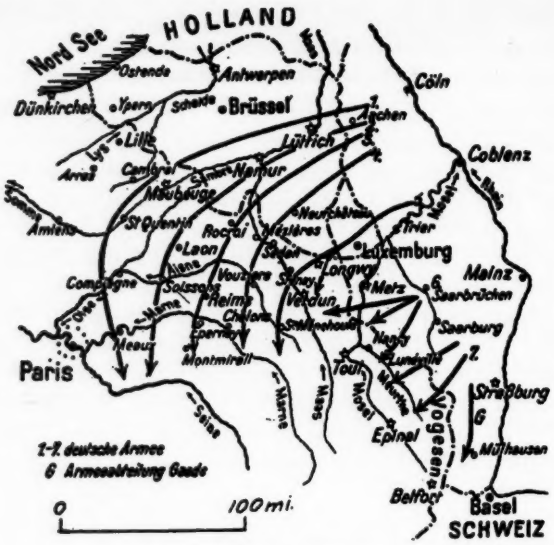
The annual reinforcement of the French defensive works prior to 1914 opposite the German border, had a decided influence on the campaign plans of the Germans, French, and British. The French general staff reinforced its eastern front by the completion of the four fortresses, Belfort, Epinal, Toul, and Verdun, as well as a series of frontier forts on the Moselle and Meuse rivers. These permitted a great concentration of forces which could be moved laterally in cooperation with the Belgians. These fortresses influenced the German plans of operations enough to create a doubt as to whether they could be captured by frontal attack, and the result was Schlieffen's plan of envelopment. It was hoped that by evading them and by threatening the French flanks that this would cause them to withdraw.

During the advance of the German right flank through Belgium and northern France in 1914, the fortresses at Liege, Namur, Maubeuge, and Antwerp retarded the operation; whereas the smaller forts, Huy, Givet, Montmedy, Reims, Laon, and La Fere (excluding Longwy), definitely delayed the operations.

LIEGE

The Belgians originally intended to defend with their main forces on either side of the fortress, having a strong advance guard on the heights east of it. The slow mobilization and the impossibility to concentrate the main force by rail west of the Meuse, according to the plan of the general staff, prevented the defense of Liege and Namur by a strong garrison. The sudden German raid toward Liege and general movement of German forces eliminated the Belgian plans. With the fall of Liege after ten days' fighting the road was open to the Belgian plain, and to the northern bank of the Meuse as well as to the important railroad lines.

Abstracted from *Militär-Wochenblatt*, 4 January 1936. "Die Einwirkung der Festungen Lüttich, Namur, Maubeuge und Antwerpen auf die Operationen 1914 im Westen," by Major General Klingbeil.

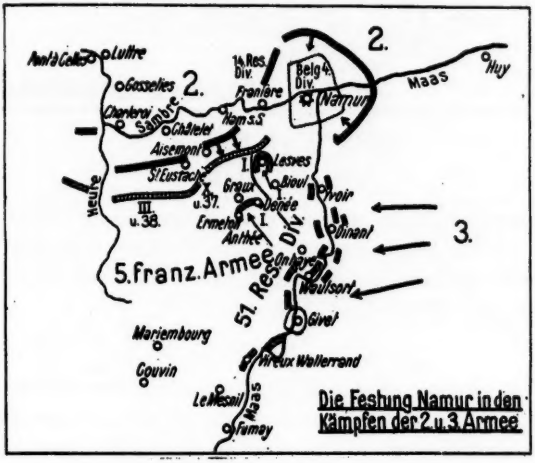


SKETCH NO. 1
LIEGE

NAMUR

This fortress was located at the junction of the Meuse and the Sambre rivers, and like Liege, was one of a chain of fortresses whose outer forts (Brialmontsche triangle forts) with their distant and close-range combat defenses possessed great defensive possibilities. The intermediate terrain possessed many fortress features. It was prepared for a three-weeks resistance. Its value rested in the fact that in conjunction with the Antwerp fortress it restricted the free mobility of the German forces advancing north of the Meuse. It also served as the crossroads of all important highways between France and Belgium and an important pivot for operations of these two armies. It did not serve as a bridgehead and flank strong-point as intended, because General Lanrezac decided to use the forces otherwise on the heights south of the Sambre sector. This had great disadvantages in that it was exposed to flank attack and the center was in danger. The German right flank, pivoting on Namur, succeeded, without a fight, to swing against the Sambre. The objectives for the three German armies were as follows: To the First and

Second Armies were assigned the enemy located west of Namur, and to the Third Army the line along the Meuse, Namur to Givet. The main effort would be against the northern side of the fortress where the terrain favored the attack. On the south, where the terrain was unfavorable, a feint attack would be made. The attack succeeded and Namur fell, 24 August 1914. The rapid fall of Namur compelled the French and British to withdraw from that salient. This opened for the German forces, which had attacked Namur, roads for an advance to the south and southwest.



SKETCH NO. 2
NAMUR

MAUBEUGE

After the British were driven back at Mons and Le Cateau, they retired to the defense of Maubeuge fortress, upon which their right flank had rested. Following the example of the French Fifth Army, they withdrew south of Maubeuge and left it to its fate. Even the German First Army passed it by in its rapid advance to the south, leaving the German IX Corps to cover the fortress against any enemy movement from the northwest and southwest. Maubeuge represented a threat against the German line of communications; therefore it was attacked on 27 August and fell on 8 September. Its

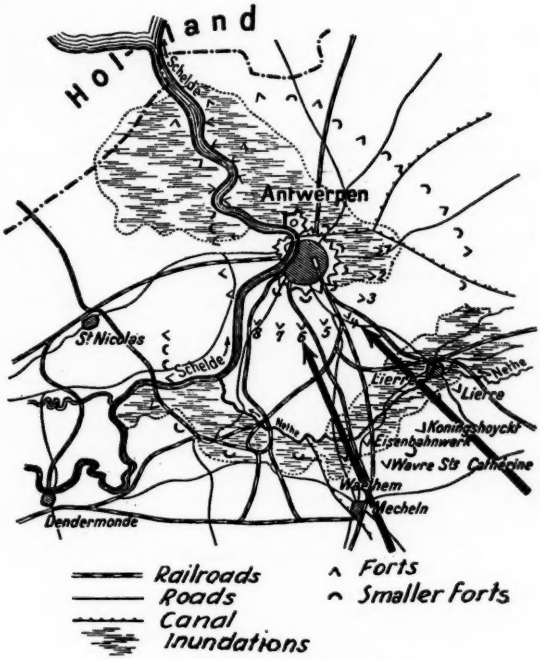
SKETCH NO. 3
MAUBEUGE

fall occurred just in time to permit the use of the investing troops in the organization of the German Seventh Army. The latter had the mission to clean up the western portion of Belgium and northern France.

ANTWERP

The fortress of Antwerp, located at the mouth of the Sheldt River, was a modern fortress 70 miles in circumference and the extreme end of the chain of fortresses. On the south, southwest, and southeast it was protected by natural water obstacles of the Sheldt and adjacent streams. After the fighting on 18 August on the Gette sector, this fortress became a serious menace to the German line of communications, because the Belgian Army had withdrawn behind the fortress walls; likewise the greater part of the defeated 4th Division withdrew from Namur to that place. The German First Army was compelled to detach the III Reserve Corps to protects its flank against the Antwerp threat when it marched through Belgium in August. On 28 August three to four Belgian divisions tried a sortie but were repelled by the German III and IV Reserve Corps. Because of the Marne counteroffensive by the Allies on 9 September, against the east flank of the German line of observation, a serious situation existed at Louvain and it was several days before the Germans were able to relieve the danger to their line of communications.

This menace could only be removed by an attack. The Germans attacked the Antwerp fortress from the southeast, although this was its strongest point. In twelve days the fortress capitulated. A great number of the garrison escaped to Ghent.



SKETCH NO. 4
ANTWERP

SUMMARY

The fortresses of Liege, Namur, Maubeuge, and Antwerp had temporarily delayed the advance of the German forces and contained considerable of these forces that could have been used elsewhere. They did menace the line of communications of the German right flank which was particularly noticeable in the Marne crisis.

Section 3

DIRECTORY OF PERIODICALS

Included in this directory are only those periodicals from which articles have been selected.

See also, Section 7, "List of Periodicals Indexed and Key to Abbreviations."

MILITARY AND NAVAL PERIODICALS

Joint Forces

Army, Navy and Air Force Gazette (Great Britain) ... 93
Fighting Forces (Great Britain) ... 98
Journal of the Royal United Service Institution (Great Britain) ... 99
Journal of the United Service Institution of India (Great Britain—India) 100
Revista del Ejercito y de la Marina (Mexico) ... 121

General Military

Army Quarterly (Great Britain) ... 94
Bulletin Belge des Sciences Militaires (Belgium) ... 95
Canadian Defense Quarterly (Canada) ... 96
Militärwissenschaftliche Mitteilungen (Austria) ... 101
Militär-Wochenblatt (Germany) ... 103
Revue Militaire Francaise (France) ... 129
Revue Militaire Suisse (Switzerland) ... 131
Wissen und Wehr (Germany) ... 136

Arms and Services

Air Arm

Revue de l'Armée de l'Air (France) ... 122
Royal Air Force Quarterly (Great Britain) ... 132

Artillery

Coast Artillery Journal ... 97
Field Artillery Journal ... 98
Journal of the Royal Artillery (Great Britain) ... 99
Revue d'Artillerie (France) ... 123
Rivista di Artiglieria e Genio (Italy) ... 131

Cavalry

Cavalry Journal ... 96
Cavalry Journal (Great Britain) ... 97
Revue de Cavalerie (France) ... 124

Engineers

Military Engineer ... 119
Pioniere (Germany) ... 120
Revue du Génie Militaire (France) ... 128
Rivista di Artiglieria e Genio (Italy) ... 131
Royal Engineers Journal (Great Britain) ... 132

INFANTRY

Infantry Journal 99
Revue d'Infanterie (France) 125

MEDICAL

Journal of the Royal Army Medical Corps (Great Britain) 99
Military Surgeon 119

ORDNANCE

Army Ordnance 94

QUARTERMASTER

Quartermaster Review 121

SIGNALS

Signal Corps Bulletin 136

TANKS

Sanct Christophorus (Germany) 132

Navy and Marines

Marine Corps Gazette 100
Naval Institute Proceedings 119

Section 4

CATALOG OF SELECTED PERIODICAL ARTICLES

This section catalogs the articles selected from Library periodicals for the current quarter. Periodicals in this Catalog are arranged alphabetically.

ARMY, NAVY AND AIR FORCE GAZETTE (Great Britain)

30 January 1936

(1) THE STRIKING POWER OF AIR FORCES. Flying Officer Dunworth

This article is a recommendation for a bomber which must possess an adequate range, a performance affording it a reasonable chance of reaching its objective, and bomb load sufficient to fulfil the aim of the raid.

6 February 1936

(2) AIR POWER AND ABYSSINIA. Brevet Colonel Voysey

In this article the author explains why the Italian air force has not met with more success in Ethiopia and that the new theory of war (that the air force is the decisive weapon) has not been disproved by events in Ethiopia but that it has not even been tested.

(3) A JAPANESE WAR PROPHET. By "Navalis"

A review of the book, "Japan Must Fight Britain," by Lieutenant Commander Tota Ishimaru, of the Imperial Japanese Navy, in which the reviewer draws the following conclusions: "If Lieutenant-Commander Ishimaru's mind, as revealed in 'Japan Must Fight Britain,' is typical of those of his countrymen, and not merely that of an ultra-jingo such as are to be found in all nations in small numbers, there is only one conclusion to be drawn. It is that the future actions of Japan cannot be prophesied by any European, but that, unless she is exhausted by the Chinese adventure upon which she is now engaged—as well she may be—not many years will pass before she will run amuck and go to war with some other Power. Which that Power will be, no man can say, not even a Japanese statesmen."

27 February 1936

(4) MILITARY ITALY FROM THE INSIDE. Brown

This article is a short survey of the changes which have taken place in the Italian Army since Mussolini became dictator. In conclusion the author states that "the new army of Italy is something very different to that of yesterday. Even if it is untrue to say that it can be compared in equipment with the forces of the western powers, there can be no doubt that it is immensely superior to the army that took the field in 1915."

5 March 1936

(5) HOW TO PREVENT THE THREATENED WAR. Lord Strabolgi

This is a timely article on the present European situation. The author states that there is a widespread expectation in Central and Eastern Europe of a war within the next two years. Lord Strabolgi then asks how this anticipated catastrophe can be prevented, or if it happens, how can Great Britain keep out of it, and answers this question by stating that collective security would be the best means. A potential aggressor should be frightened or coerced into keeping peace by an elaborate system of sanctions, both economic and military.

12 March 1936

(6) THE PREVENTION OF WAR. Sir Alexander Lawrence

(7) THE REALITIES OF THE DESERT CAMPAIGN

This article reviews the books, "Wassmuss," by Sykes, and "A Paladin of Arabia," by Bray. Both books deal with the inner history of that

"war with war" which was waged mostly in stealth and cunning by four great powers in the Middle East from 1914 to 1918. Both books are valuable contributions toward a final understanding of the complicated actions which ebbed and flowed over the mountains and plains of the Middle East during those tragic years.

2 April 1936

(8) AVIATION AND THE DEFENCE OF CANADA. By Canadian Correspondent

9 April 1936

(9) CRUISER AND AIRCRAFT CARRIER COMBINED. By "Seaplane"
(10) MODERN MAN—MODERN DISCIPLINE. Captain Macnamara

ARMY ORDNANCE

January-February 1936

(1) LAWRENCE AND THE ARAB REVOLT. Captain Nickerson

A short military record of Lawrence of Arabia, taken from "Seven Pillars of Wisdom." The author states in conclusion that this outline "does little justice either to his 'Seven Pillars of Wisdom' as a whole or to his achievement on the personal side of command, particularly the ascendency which he (Lawrence) gained over the Arabs."

(2) ORDNANCE OF THE CONFEDERACY. Brigadier General Gorgas

This historic document comprises notes of Brigadier General Josiah Gorgas, Chief of Ordnance of the Confederacy, pertaining to the status of small arms, ammunition, artillery, arsenals, and the manufacture of infantry, artillery and cavalry equipment at the beginning of the Civil War.

(3) OIL AND NATIONAL DEFENSE. Brooks, Major, & Snider

A very interesting and pertinent article about the production of oil and how the decrease of output might some day (and perhaps not far removed) place the United States in a position to depend on foreign sources for oil. This is important from a defensive point of view. At present petroleum is not included in the list of essential raw materials for which we may depend upon foreign sources. Therefore the question of oil might well be given some emphasis in the plans of national defense.

(4) OUR DEFENSE NEEDS. Brigadier General Delafield

An address by General Delafield given to a group of men's clubs, at St. Paul, Minnesota, 11 November 1935, in which the author states that our national defense has two great weaknesses that seem to make it largely ineffective: first, the lack of enough well trained officers and noncommissioned officers; and second, no adequate supplies of modern munitions and no means to produce them quickly enough in sufficient quantities.

(5) THE BASIC BIOLOGIC ASPECT OF WAR. Major Fox

This is an address by Major Leon A. Fox, M.C., on the causes of war.

(6) THE FIRST BALLISTICIAN. THE LIFE AND WORKS OF TARTAGLIA OF BRESCIA. Colonel Spaulding

ARMY QUARTERLY (Great Britain)

April 1936

(1) LAND, SEA AND AIR WARFARE. Nickerson
(2) ECONOMY OF FORCE? A NOTE ON THE NATIONAL STRATEGY OF THE BRITISH IN THE WAR, 1914-1918. Major-General Bird
(3) "IF THERE HAD BEEN A.F.Vs. AT MONS AND LE CATEAU IN 1914." Major Thrupp
(4) A PSYCHOLOGICAL ANALYSIS OF MILITARY MORAL. Lieut.-Colonel Daly
(5) ITALY AND ABYSSINIA. Lieut.-Colonel de Watteville
(6) THE BRITISH ARMY AND WAR. Captain Denne
(7) A GERMAN NOVELIST'S EXPERIENCES AS A BATTALION COMMANDER. Brigadier-General Edmonds
(8) THE BELGIAN MILITARY PROBLEM. Leurquin
(9) "TWO EMPIRE FRONTIERS." Lieut.-Colonel Baird-Smith

BULLETIN BELGE DES SCIENCES MILITAIRES (Belgium)

By Major F. During, Infantry
and
First Lieutenant J.F. Trent, Field Artillery

October 1935

(1) PAGES D'HISTOIRE DE L'ARMÉE BELGE AU COURS DE LA GUERRE 1914-1918.—PARTICIPATION DU I/13 À LA REPRISE ET À LA DÉFENSE DE KEYEM LES 18 ET 19 OCTOBRE 1914. [History of the Belgian Army in the World War.—Pariticipation of the 1st Battalion Belgian 13th Infantry in the defense of Keyem in 1914.] Lieut.-Colonel Brabant

This is an account of the part taken by the 1st Battalion Belgian 13th Infantry, in the recapture and defense of Keyem on the Yser River on 18 and 19 October 1914. This exploit was carried out in spite of heavy losses and even though the Belgians had eventually to retire and Keyem fell into German hands, the advance of the Germans across the Yser was considerably delayed.

(2) LE ROI ALBERT IER ET L'INFANTERIE BELGE, CONFÉRENCE FAITE À BRUXELLES. [King Albert and the Belgian infantry.] General Weygand

This is an address delivered by General Weygand at Brussels on 1 May 1935. It is an appreciation of the part taken in the World War by the Belgian Army under its King, by a distinguished French officer. Long before the war broke out, King Albert knew of the Schlieffen plan to invade France through Belgium. During a visit to Potsdam in 1913, both the German Emperor and von Moltke assured him that war with France was imminent and that he was facing the alternative of becoming an ally or an enemy of Germany. It was then that he made up his mind as to which course he would take. The rest of the story of King Albert at the head of the Belgian Army is a matter of history.

(3) LIAISON ET OBSERVATION DE L'APPUI DIRECT DANS L'ATTAQUE. [Liaison and observation of direct artillery support during the attack.] Lieut.-Colonel Melen

From innumerable observations and experiences in maneuvers it is thought that the best way of insuring that the artillery knows the needs of the infantry and aid it without delay in the attack, is to provide for the advance of observation equipment and liaison personnel immediately behind each attack company of the first echelon or at least behind each two attack companies, according to the dictates of the terrain.

Moreover, it is thought that the request for artillery fire from the infantry company or platoon commander through the normal channels of the battalion and the regiment is too slow. This channel could well be supplemented by an additional channel wherein the infantry company and platoon commander could contact the artillery observer who would then see and have first hand information of the target on which he later will observe the fire.

The channel would thus be from the infantry company commander to the artillery observer to the artillery battery commander instead of from the infantry company commander to the infantry battalion commander to the infantry regimental commander to the artillery groupment commander to the artillery battery commander; certainly a wise and needed simplification.

(4) QUELQUES IDÉES SUR LA GUERRE DE DEMAIN. [Some ideas on the war of tomorrow.] Captain Defraiteur

The author gives his views, mainly obtained from German sources, of what a future war will be. A slow, protracted war, that exhausts both sides, is to be avoided at all costs. A crushing victory must be gained by brutal, rapid and surprise aggression.

The situation has changed since 1914. It took time to maneuver the huge armies then, while now all frontiers are solid fortified walls, against which a frontal attack must be made. It would be a waste of time to attempt to turn a flank. The attacking German Army would consist of three parts: (a) Attack troops for piercing the enemy's front, consisting of mechanized divisions and a powerful air force. (b) Mobile troops,

consisting of motorized divisions, and armored cars capable of traveling across country. (c) Defense troops, consisting of divisions of the old type.

November 1935

(5) LA DÉFENSE NATIONALE EN BELGIQUE DEPUIS 1830. [The Belgian national defense after 1830.] (I) Major Mersch

In this first installment the author deals with the national defense of Belgium between 1830 and 1839. Belgium proclaimed its independence by a provisional government on 4 October 1830. At that time there was practically no national army, but in order to guard against a Dutch invasion a volunteer army was organized.

In August 1831 hostilities broke out with Holland, which might have ended disastrously for Belgium had France and Great Britain not intervened to conclude an armistice. Relations with Holland continued to be strained for several years. In April 1839 Belgium signed a treaty determining the boundary between the two countries.

(6) LE CONFLIT DU GRAN CHACO. [The Chaco conflict.] Captain Materne

Strained relations between Bolivia and Paraguay over the Gran Chaco dates back to 1852, and in spite of all attempts to bring about a peaceful settlement, it reached an acute stage in 1932. The dispute was complicated by economic interests, viz., the possession of mines and oil fields. The author then gives an account of the military operation, which is taken from an article by Lieutenant Farnsworth, appearing in the "Infantry Journal," June 1935.

December 1935

(7) LA DÉFENSE NATIONALE EN BELGIQUE DEPUIS 1830. [The Belgian national defense after 1830.] (II) Major Mersch

In this installment Major Mersch describes the history of the national defense of Belgium between 1839 and 1870. The relations between Belgium and Holland became friendly, but Belgium, fearing a danger from France in 1848, worked out a system of defense in 1851 as follows: (a) Abolition of all fortresses no longer required; (b) Retention of fortresses for defense; (c) Organization of an army of 100,000 men, 60,000 of which were to form a field army and 40,000 reserves; (d) Creation of an entrenchment around Antwerp.

In 1867 Napoleon III wanted to absorb Belgium to counterbalance the extension of Prussian power after the defeat of the Austrians at Sadowa. Belgium became entirely concentrated on defensive policy.

In 1870 the field army was increased to 120,000 men and the defenses of Antwerp strengthened.

CANADIAN DEFENCE QUARTERLY (Canada)

April 1936

(1) THE ATTACK AT DAWN. By "Turret"

(2) THE FENIAN TROUBLES AND CANADIAN MILITARY DEVELOPMENT, 1865-71. By "C.P. Stacey"

(3) ANGLO-EGYPTIAN RELATIONS

(4) AEROPLANE AMBULANCE EVACUATION IN A MAJOR WARFARE SITUATION. Lieut.-Colonel Darby, U.S. Army

(5) SOME ASPECTS OF BRITISH STRATEGY

(6) ITALY, ETHIOPIA AND WORLD AFFAIRS. Major Reynolds

(7) THE MILITARY VALUE OF THE WHITE RACE. Major Oxley

CAVALRY JOURNAL

January-February 1936

(1) THE CAVALRY AND MECHANIZATION, 1936. Lieut.Colonel Surles

Colonel Surles analyses in this article the present status of mechanization in the military scheme, and in particular, the effect of mechanization on the cavalry arm. The article contains a comment by General Malin Craig, Chief of Staff.

(2) ONE HUNDRED AND THREE FIGHTS AND SCRIMMAGES: THE STORY OF GENERAL REUBEN F. BERNARD. (III) Russell
A continuation of the story of General Reuben F. Bernard.
(3) A CAVALRY RECONNAISSANCE SQUADRON FOR AN INFANTRY DIVISION. Major Wilson
The author recommends that a cavalry squadron should become an organic part of an infantry division, to be employed as a reconnaissance group. He suggests that the squadron be organized as follows:
Squadron headquarters
Headquarters and service troop (motorized) divided into the following platoons:
Headquarters and staff
Communications
Pioneer and demolition
Supply and transportation
Maintenance
One armored and scout car troop (mechanized)
One machine gun troop (mechanized)
One rifle troop (horse).
(4) CAVALRY LEADERSHIP TEST FOR SMALL UNITS. 1st Lieutenant Hunter
(5) FAST MARCHING WITH HORSE CAVALRY. Lieut.Colonel Benson

March-April 1936

(6) ONE HUNDRED AND THREE FIGHTS AND SCRIMMAGES: THE STORY OF GENERAL REUBEN F. BERNARD. (IV) Russell
(7) MOBILIZATION TEST OF PROVISIONAL TROOP, 8TH CAVALRY. Captain Yale
(8) HORSES AND MOTORS
(9) EMPLOYMENT OF CAVALRY MACHINE GUNS AND 37-MM. GUNS
(10) A FORM FOR AN ESTIMATE OF THE SITUATION
(11) A MAP PROBLEM (EMPLOYMENT OF MACHINE GUNS AND 37-MM. GUNS)
(12) HORSE ACTIVITIES AT FORT MEADE. Lieutenant Bixel
(13) BATTLEFIELD MOBILITY. Colonel Baer
(14) PERSHING AND THE ANVIL CHORUS. DeWeerd
(15) SAILING THE THREE C'S. Colonel Johnson and Captain McManus
(16) THE GREAT DELUSION. Major Burns
(17) RIVER CROSSING BY RAFTS MADE OF HABERT SACKS

CAVALRY JOURNAL (Great Britain)

April 1936

(1) THE YEOMANRY AT GAZA II. (APRIL 17TH-19TH, 1917). Major Teichman
(2) THE CAPTURE OF SEMAKH, 25TH SEPTEMBER, 1918 (ACTION BY THE 4TH AUSTRALIAN LIGHT HORSE BRIGADE). Major McKenzie
(3) AN ATTACHMENT TO GERMAN CAVALRY. Captain Sword
(4) THE CONQUEROR OF GOLCONDA. Major Sheppard
(5) LAKE AND VICTORY. Part IV. Colonel Maunsell
(6) THE OLD CAVALRY CANTONMENT. Colonel Hamilton

COAST ARTILLERY JOURNAL

March-April 1936

(1) PERSHING AND THE ANVIL CHORUS. DeWeerd
(2) HISTORICAL BACKGROUND OF ITALO-ETHIOPIAN DISPUTE. Major Lowry
(3) SPY AND COUNTER-SPY. Part II. Johnson
(4) ANTIAIRCRAFT MACHINE-GUN TRACERS. Major Harris
(5) SAILING THE THREE C'S. Colonel Johnson and Captain McManus
(6) FIELD TRAINING OF THE 61ST C.A. (AA). Captain McConnell
(7) IMPROVISED ANTIAIRCRAFT FIXED MOUNT. Lieutenant Kimmel
(8) THE GREAT DELUSION. Major Burns

(9) ORGANIZATION OF SEARCHLIGHTS IN ARTILLERY REGIMENTS. Major Irvine
(10) TRAINING THE SEARCHLIGHT-SOUND LOCATOR TEAM. Captain Goff
(11) THE DANGEROUS GRADE. Colonel Glassburn
(12) FACTS AND FABLES. Kibler
(13) EMERGENCY METHODS OF FIRE CONTROL. Part IV. Major Campbell
(14) WARFARE IN THE 18TH CENTURY. Lieut.Colonel Scammell
(15) SUGGESTIONS FOR BETTER RESERVE TRAINING. Captain McMullen

FIELD ARTILLERY JOURNAL

March-April 1936

(1) TRACE CHAINS AND CAISSONS FAREWELL. Captain Eckert
(2) FEATURES OF THE FIRST ARMY MANEUVERS FROM AN ARTILLERY VIEWPOINT. Colonel Greer
(3) THE NEW 75MM GUN CARRIAGE M2. Major Wallace
(4) NOTES ON THE OPERATION OF MOTOR CONVOYS FROM FORT BRAGG TO TEXAS. Lieutenant Matthews
(5) WARFARE IN THE EIGHTEENTH CENTURY. Lieut.Colonel Scammell
(6) CRACKERS AND CARBURETORS. Captain Grace
(7) PROPHECY OR FANTASY. Lieut.Colonel Wood

FIGHTING FORCES (Great Britain)

February 1936

(1) THE MISTS OF THE MARNE. By "Basilisk"

The author in this short critical article classes the battle of the Marne, in which four British divisions sat down serenely in front of the "G" of the biggest "Gap" ever presented to them, as one of the great "Lost Opportunities" of all times.

(2) VII.—THE LESSONS OF FIVE EPISODES. Lieut.-Colonel Burne

"Fighting Forces" has published in the last five issues, articles which dealt with four episodes from the Gallipoli and Mesopotamian campaigns, and one from the Franco-Prussian War. This article sifts these five episodes and discovers that many of them agree in teaching the same lessons. Each lesson is given a subheading followed by the examples which serve to illustrate it. The lessons are grouped as follows: The value of surprise and secrecy; The necessity for initiative on the part of subordinate commanders; The importance of good morale; The failure to read the mind of the opposing commander and to picture the situation "The Other Side of the Hill"; The value of information; The opportunities that are missed owing to the reaction after the strain of a hard-fought battle; The failure of cavalry to obtain accurate and timely information; The tendency for the defeated force to retreat before resting; The rareness of prompt pursuit by the victors; The needlessness of holding in hand large reserves when attacking; The failure to seize and exploit opportunities; The importance of unity of direction and control; The frequency of conflicting interests between strategy and policy; The difficulty of maintaining lateral communications.

(3) THE INTENTION PARAGRAPH OF OPERATION ORDERS. Brigadier Anstey

The author discusses the wording of combat orders, stating that the ability to express intentions and instructions in clear, unambiguous and concise English, is an essential faculty for successful command and that the difficulties that are experienced in wording of orders arise from a lack of power of expression in English.

(4) THE LONDON NAVAL CONFERENCE. Captain Tuke
(5) PHYSICAL TRAINING IN THE SERVICES. Commander Newcombe
(6) SOME CORRESPONDENCE ABOUT BOMBING

April 1936

(7) PERPLEXITIES OF THE ARMY OFFICER. By "Senior Major"
(8) LLOYD GEORGE AND HAIG. By "Basilisk"

(9) THE PREVENTION OF WAR
(10) HINTS ON STUDYING THE RUSSO-JAPANESE WAR. Lieut.-Colonel Burne
(11) NAPOLEON AND WATERLOO. By "Historicus"
(12) NIGHT FLYING. By "Solaire"
(13) PHYSICAL TRAINING IN THE SERVICES. Commander Newcombe

INFANTRY JOURNAL

March-April 1936

(1) PERSHING AND THE ANVIL CHORUS. DeWeerd
(2) OUR LAST INDIAN WAR. Major Colby
(3) BATTLE OF PICARDY AND THE DOUBLE PENETRATION. Part I. Lieutenant Ehrgott
(4) SAILING THE THREE C'S. Colonel Johnson and Captain McManus
(5) ON COMBAT ORDERS. Major Pendleton
(6) THE INFANTRY DIVISION. Brigadier General Roberts
(7) SPY AND COUNTER-SPY. Part II. Johnson
(8) THE GREAT DELUSION. Major Burns
(9) DECISIVE ELEMENT IN THE ATTACK
(10) WARFARE IN THE 18TH CENTURY. Part III. Lieut.Colonel Scammell

JOURNAL OF THE ROYAL ARMY MEDICAL CORPS

(Great Britain)

April 1936

(1) AN OUTLINE OF PSYCHOLOGY. Lieut.Colonel Nicholls
(2) FIVE ARMY CASES OF A DENTURE IMPACTED IN THE FOOD OR AIR PASSAGES. Major Woods
(3) THE DOCTOR'S WAR, 1899-1902. By D.A.D.M.S.
(4) THE HEALTH OF THE ARMY

JOURNAL OF THE ROYAL ARTILLERY (Great Britain)

April 1936

(1) SOME NOTES ON COUNTER-BATTERY WORK WITH DIVISIONAL ARTILLERY. Major MacLeod
(2) "WHAT RE-ARMAMENT MEANS." Major-General Headlam
(3) ZEEBRUGGE AND ITS LESSONS. Captain Murley
(4) THE PROBLEM OF MEMEL. Major Reynolds
(5) MARCHING THROUGH SINAI. 1799. 1916. PART II: EL ARISH. By "Pollaniska"

JOURNAL OF THE ROYAL UNITED SERVICE INSTITUTION

(Great Britain)

February 1936

(1) THE HIGHER COMMANDER. Major-General Wavell

In this article Major-General Wavell analyses the attributes of the higher commander. He gives the essential qualifications for a commander and considers the modern conditions in which high command has to be exercised and finally suggests measures which should be taken now to produce adequate commanders in war. He states that there are two types of commander (and both are essential in an army): first, there is the commander who, being confident in his knowledge and ability, is fitted for independent command; and second, there is the competent executive (the French call him "le bon Général ordinair"). This type is excellent at handling and administering troops under the orders of a superior, but who often fails when on his own, while the independent commander is often a difficult subordinate.

(2) THE DOCTRINE OF STRATEGICAL BOMBING. Major Stewart

A review of the fifth volume of the British Official Air History of the War ("The War in the Air," by H.A. Jones).

(3) THE HARE, THE TORTOISE AND THE EAGLE. By "Solaire"

In this article the author discusses the slowness of movement of the Italian Army in Ethiopia, as compared with Sir Robert Napier's advance in 1868 and that of the Italians in 1895 over the same terrain. He states that the Italians apply the lessons learned from European battlefields too rigidly in the conduct of a war of movement over a wide and primitive terrain. But, according to the author, the basic reason for the slowness lies in the form and organization of all armies. The desire for stronger armament causes a demand for more transport; the desire for better communication leads to more complete communications, and the desire for superior organization creates an additional organization to deal with the development. Therefore what has been gained by the advent of mechanization is largely offset by the growth of impedimenta.

The author then states that the huge number of depots, the repair shops, and the parked motor vehicles, give to the airmen just the objectives they need, and that in the airplane lies the key to the problem of increased mobility. He concludes that every reasonable use of the advantages which mechanization on the ground has to offer should be made, but realizing its limitation, the possibilities held out by the air should be fully developed.

(4) JELLICOE. Admiral Halsey

(5) THE RESERVES AT LOOS. Brigadier-General Edmonds

(6) OIL FROM COAL IN WAR TIME. Colonel Bristow

(7) AUSTRALIA'S DEFENCES. Admiral Richmond

(8) A JOURNEY TO SOME PENINSULAR BATTLEFIELDS. Captain Swynnerton

(9) THE EMPLOYMENT OF ANTI-AIRCRAFT SEARCHLIGHTS. Lieut.-Colonel Grove-White

(10) THE LEAGUE OF NATIONS AND THE ITALO-ABYSSINIAN AFFAIR

(11) THE HOARE-LAVAL PEACE PLAN

(12) OIL SANCTIONS

(13) THE ITALO-ABYSSINIAN WAR

(14) THE SECOND LONDON NAVAL CONFERENCE

JOURNAL OF THE UNITED SERVICE INSTITUTION OF INDIA

(Great Britain—India)

January 1936

(1) THE DARDANELLES CAMPAIGN. THE LANDING AT ANZAC. Major Westmorland

(2) A SHORT REVIEW OF MECHANISATION. Lieut.-Colonel Baird-Smith

After discussing the development of mechanization since the War, the author concludes that motorized cavalry, probably horseless, will act with light armored cars and light tanks, while infantry, brought to the battle zone by motors, will be accompanied and supported by tanks, the model of which is still the subject of experiment.

(3) INDIAN ARTILLERY. Major Laws

MARINE CORPS GAZETTE

February 1936

(1) FLEET MARINE FORCE LANDING BOATS. Lieutenant Johnson

(2) MOBILE MACHINE GUN NESTS

(3) THE EDUCATION AND TRAINING OF YOUNG OFFICERS. Colonel Miller

(4) THE ANTI-AIRCRAFT MACHINE GUN. Captain Deese

(5) ARTILLERY AERIAL PHOTOGRAPHIC MAPPING. Captain Kaluf

(6) AN INTRODUCTION TO THE GALLIPOLI CAMPAIGN. Part I. Captain Mason

(7) MARINES AS AN AID TO DIPLOMACY IN CHINA. Captain Carlson

(8) THE INFANTRY-ARTILLERY TEAM. Lieutenant Victory
(9) THAT MYSTERIOUS "PEKING MUTINY." Lieut.Colonel McClellan

MILITARWISSENSCHAFTLICHE MITTEILUNGEN (Austria)

By Major F. During, Infantry

October 1935

(1) DIE ENTWICKLUNG UNSERES KAMPFVERFAHRENS VOM KRIEGSBEGINN BIS ZUR GEGENWART. [The development of tactics of the Austrian Army from the beginning of the World War up to the present.] (V) General v.Pitreich, Reserve

In this concluding installment the author deals with mobile warfare. The article covers the attack in mobile warfare, the attack against a prepared position in mobile warfare and the defense in mobile warfare. General v.Pitreich does not believe that the tank and the airplane will supersede artillery and machine guns, but he demands for the troops the most efficient antitank and antiaircraft defense.

(2) DIE ERSTE SELBSTTÄTIGE, ELEKTRISCHE RICHTVORRICHTUNG FÜR LUFTABWEHR-KANONEN. [The first automatic electric aiming arrangements for antiaircraft guns.] Captain Schneider, Retired

According to the electro-technical monthly, "Praktisches Wissen," the Swedish Army has introduced mobile antiaircraft artillery in which the firing data are automatically determined and transmitted electrically to the gun. Captain Schneider points out that this introduction is not an innovation, as the first completely automatic antiaircraft battery of four guns went into positions on the Italian Front near Gorgo di Molini, on 21 February 1918. The guns remained in action for eight months.

(3) UBER DIE AUSBILDUNG IM GASSCHUTZDIENSTE. [Training in gas protection.] (I) Major Hirsch

This article is intended mainly to assist the regimental gas officers, but it will be found instructive to everyone. Major Hirsch starts with the duties of a gas officer, the training of all ranks, and gas discipline. His remarks about gas discipline at the beginning of the article are of interest: "The maintenance of the fighting efficiency of the soldier, while wearing his gas mask, and under the immediate threat of effective enemy gas, makes very high demands on the soldier's morale and physical strength. Troops can be equal to these demands only when they possess a high degree of gas discipline, the foundations of which are rooted in skill in the use of, familiarity with, and absolute confidence in their gas mask and a knowledge of the nature of gas and of its limitations. Gas discipline insures at the moment of danger that the appropriate measures of protection are undertaken in perfect peace of mind and that the soldier's combat efficiency remains unimpaired. This can be accomplished only by training and practice."

The author then discusses war gases and gas attacks.

November 1935

(4) "VORSTOSZ SIEDLEC." DIE TRAGÖDIE DER K.U.K. ARMEE IM SEPTEMBER 1914. [The attack at Siedlec. The tragedy of the Austro-Hungarian Army in September 1914.] General Heye

This article is a short extract from Volume I of the History of the Prussian Landwehr Corps, 1914-1918, better known perhaps, as the Woyrsch's Corps, which was located on the extreme left of the Austro-Hungarian Armies in Poland in September 1914. The author of the history is General Heye, who was at that time chief of staff of the Woyrsch Corps. Of course it is of interest to note what he has to say as to whether an attack against Siedlec should be made and when and how, but actually he says little or nothing that is new, but his sidelights are illuminating.

The author thinks that Conrad was right in attempting the offensive, even without German cooperation, which had been part of the original plan. The tragedy was that the attack on Siedlec, in order to pinch out Warsaw was made alone against overwhelming odds and the Austro-Hungarian losses were enormous.

(5) UBER DIE AUSBILDUNG IM GASSCHUTZDIENSTE. [Training in gas protection.] (II) Major Hirsch

This concluding installment deals with the gas mask, Model M-34, construction of filter, method of wearing the mask, gas chamber test, etc., and it describes the oxygen apparatus. It also deals with the practical training of all ranks in gas protection, including the selection and training of special personnel in gas detection.

December 1935

(6) EIN MISZLUNGENER UND EIN GEGLÜCKTER RUSSISCHER DURCHBRUCH WÄHREND DER KÄMPFE AN DER ÖST.-UNG. STRYPA-FRONT IM WINTER 1915/16 UND IM JUNI 1916. [An unsuccessful and successful breakthrough by the Russians on the Austro-Hungarian Front in the winter of 1915-16 and in June 1916.] Major General Steinitz, Res.

The two events referred to occurred during the time that the Austro-Hungarian front was stabilized along the River Strypa, a tributary of the Dniester, in the winter of 1915-16, and in June 1916, respectively. The same Russian Corps (II) made both attacks, and at no great distance apart. These two attacks on the Strypa position are important because they serve as milestones in the history of the development of position warfare, and the experience that they afforded helped to pave the way to a fundamental change in defense methods.

The Russians' first attack came on 29 December 1915. It was a complete strategic surprise, being preceded by no concentration of heavy artillery, no bombardment, and no wire-cutting. Nine days later, and after five days of heavy fighting, they called off the fight, having lost over 13,500 officers and men. There is no doubt that the Austrians learned the wrong lesson from their success, in that they attributed it to holding a strongly fortified line in strength. They spent the next five months in improving the fortifications.

On 4 June 1916 the Russians began their second attempt on the Strypa line. This time they started with two days' heavy artillery bombardment; they had active artillery observation from aeroplanes, took photographs and dropped bombs. During a lull in the firing their patrols came out to ascertain the exact state of the wire. On 6 June the assault came with such vehemence that the position was overrun, and the Russian Army Commander ordered the II Corps to "swing to the right, roll up the Austrian line and bring about mobile warfare." Passive defense, with the the front line held by large numbers and only small sector reserves, was the undoing of the Austrians. Many of them were captured in their front-line dugouts, just as the Germans were a month later on the Somme. Their failure taught them a new, deeper and less rigid way of holding the front, just as the Russians learned from the failure of their first attempt on the Strypa line the necessity of systematic artillery preparation.

(7) KAMPFWAGENTRUPPEN IM RAHMEN DER OPERATIONEN EINER ARMEE. [Employment of tanks with an army.] Lieut.Colonel Michoux

The author, by a concrete case, shows the distribution, incorporation and employment of tanks. As a continuation of the situation at the time of the battle of the Marne in 1914, "South" before superior numbers of "North" retires to the south away from Paris. "North" concentrates in the area: Amiens—Beauvais—Gisors, a new Army (Tenth), its concentration being covered by a cavalry corps, on the Seine. The mission of the new army is to pass west of Paris, crossing the Seine between Paris and Vernon, to advance via Rambouillet on Orleans and to attack "South's" line of communications. Opposing the Tenth Army on the left of the Siene, over which all bridges are destroyed, are parts of a mechanized division, but reinforcements were on the way from Champagne and Verdun. The operations of the Tenth Army are dealt with under the following headings: (a) The crossing of the Seine and establishment of a bridgehead; (b) Bridging operations; (c) Capture of the Rambouillet Forest; and (d) Offensive in the open country south of the river Orge.

This installment gives the plans for the Seine crossing and the detailed orders of the left corps for the same. The Tenth Army consists of 3 corps of 4 divisions each, and has attached to it from the General Reserve, 4

regiments of 2 tank battalions each, 2 tank transports, and 1 army tank park.

MILITAR-WOCHENBLATT (Germany)

By Major F. During, Infantry
and
Major G.J. Braun, Infantry

11 October 1935

(1) SEEGEWALT IN DER GESCHICHTE. [Seapower in history.] (V) Admiral Meurer, Retired

In this fifth installment, Admiral Meurer discusses the present naval situation of the sea powers. He states that in the balance of sea powers one must consider the Oceanic and European balance. The United States and Japan belong to the first category, while France and Italy belong to the latter, and Great Britain comes under both.

(2) DIE KÜNFTIGE ENTWICKLUNG DER PANZERFAHRZEUGE. [Future development of armored vehicles.] Brandt

The author recommends: (a) Armored cars with a protective armor against 20-mm. weapons and of a weight of 8 tons, for reconnaissance purposes; (b) Fast tanks, having a large cruising radius and a protective armor against 20-mm. weapons, weighing 10 tons, for wide envelopment and attacks against lines of communication; (c) Heavy tanks having a protective armor against 47-mm. weapons and a weight of over 30 tons, for breakthrough operations; (d) Large tanks having a protective armor against 75-mm. weapons and a weight of 100 tons, for attack against artillery positions.

(3) ERDAUFKLÄRUNG BEI NACHT. [Terrestrial reconnaissance at night.] By v.G.

The author questions whether armored cars will be able to fulfill all reconnaissance missions of cavalry. His reply is in the negative. He cites two examples from 1914 in which small cavalry patrols by advancing across country were able to reconnoiter in rear of the enemy lines. One patrol started at 3:00 AM, reaching a woods in rear of the enemy, and remaining there all day in observation, returning the next night to its own lines. In spite of the fact that movements were made only under cover of darkness, the patrols had to go across country. The author states that only actual conditions will show whether authorized vehicles will be able to take over this role of the cavalry.

(4) DIE GROSZEN ITALIENISCHEN HEERESMANÖVER. [The Italian Army maneuvers.] Lieut.Colonel Himpe

The Italian maneuvers took place from 26 to 30 August 1935. The reason for the maneuvers, in which 19 divisions participated, was to test (a) boundaries for large units, (b) cooperation between infantry, artillery and air arm, and (c) services of supply. The maneuvers proved that it is possible to break through the enemy front and by proper exploitation prevent not only his further advance but his desire to change into stabilized warfare. It was noted that the training in camouflage had so far progressed that entire divisions were rendered invisible.

18 October 1935

(5) DIE NACHRICHTENTECHNISCHE FÜHRUNG MECHANISIERTER VERBÄNDE. [The technique of communications of mechanized units.] Major Bertkau

Major Bertkau states that the peculiarities of motorized and mechanized units make it necessary for the commander to employ technical means of communications. This fact necessitates that all such units must have as an organic part a sufficient number of communications troops. The use of airplanes, radio, and radio telephones are most essential. All lower units should be equipped with receiving and sending sets and in order to transport this equipment and the necessary men, all kinds of motor vehicles, from motorcycles to the heaviest armored vehicles, are considered necessary.

(6) LEHREN AUS DEM FESTUNGSKRIEGE. [Lessons derived from attacks against fortresses.] Major Köhler, Retired

According to the author the following are necessary for a successful attack against fortresses: (a) courageous and well-planned use of all means of attack, (b) rapidity of advance, (c) increase of fire-power to its full limit, and (d) surprise. While during the War an attack took from 8 to 14 days, today such an attack can not last longer than 8 to 14 hours in order to be successful. Air forces and tanks are essential. Without superiority in the air no attack against a fortress will succeed today.

(7) ITALIEN GEGEN ABESSINIEN. [Italy versus Abyssinia.] Colonel v.Xylander, Retired

In this installment the author discusses the mobilization, transportation, and industry of the Italians.

25 October 1935

(8) SCHLIEFFEN-PLAN VON 1905, MOLTKE-PLÄNE 1908 BIS 1914 UND SCHLIEFFEN-PLAN 1912. [Schlieffen's plan of 1905, Moltke's plans of 1908 to 1914, and Schlieffen's plan of 1912.] Colonel v.Mantey, Retired

The author analyses the original Schlieffen plan of 1905 and the change Schlieffen made in 1912, when he wrote "that the entire front down to the Swiss frontier must be attacked." The reason the Schlieffen plan could not be followed in its entirety was due to lack of railroad facilities; therefore Moltke was forced to make necessary changes. Colonel v.Mantey concludes that the desired annihilation on 23 August 1914 on the north of the British Fifth Army and the mass of the French Fifth Army was not accomplished, was not due to the changes in the plan but it lay in the fact that part of the commanders followed what is now commonly known as the "deluded Schlieffen plan," instead of orders which were given in accordance with the existing situation in 1914.

(9) EINSATZ NEUZEITLICHER MOTOMECHANISIERTER KRÄFTE AM NORDFLÜGEL DES DEUTSCHEN OSTHEERES 1915. [Employment of modern mechanized forces at the north flank of the German Army in the East in 1915.] (I)

Abstracts from the book, "Tactics of Fast Moving Troops," in which the author assumes that both German and Russian troops in 1915 had mechanized forces at their disposal. The author states that it is erroneous to think that one will find unprotected gaps or flanks so that mechanized reconnaissance detachments or large fighting units will be able to pass through or go around the enemy lines rapidly. The author further states that the terrain dictates the method of defense against mechanized units.

(10) GEDANKEN ÜBER DIE ORGANISATION DES SANITÄTSDIENSTES BEI EINER MOTORISIERTEN DIVISION. [Organization of medical units in a motorized division.] Captain Hirschberger

The author raises the question whether the organization of medical units of an infantry division is suitable for a motorized division and answers it in the negative. He suggests the following: (a) The burden of the evacuation should be changed from the division to the regiment, and (b) to supply sufficient means of transport (ambulance) which in mobility and equipment and even armor are suitable for a motorized or mechanized division. He then recommends that (a) Each company should have one medical noncommissioned officer and from 2 to 4 men, equipped with a motorcycle with sidecar. The sidecar should be so constructed that a wounded man can be placed therein in a lying position. (b) Each battalion should have 2 medical officers, one noncommissioned officer, one medical motor truck, and one motorcycle with sidecar. The truck should be so constructed that it can be used, if necessary, for minor surgical operations. (c) Each regiment should have one medical officer, one noncommissioned officer, one motorized medical platoon, consisting of 2 medical officers (one should be a surgeon), 40 enlisted men, one armored car, one motorcycle with sidecar, one motorcycle, solo, one truck equipped for surgical operations, 5 motor ambulances (2 of which should be able to cross all kinds of terrain), one truck for medical supplies, one truck for transportation of personnel, and one truck (field kitchen). (d) The division headquarters should have 2 officers, 2 noncommissioned officers, one armored car, and in addition to the motorized platoon as suggested for the regiment, 2 trucks for medical equipment.

4 November 1935

(11) EINSATZ NEUZEITLICHER MOTOMECHANISIERTER KRÄFTE AM NORDFLÜGEL DES DEUTSCHEN OSTHEERES 1915. [Employment of modern mechanized forces at the north flank of the German Army in the East in 1915.] (II)

In this concluding installment the author discusses the use of mechanized forces at the battle of Vilna in September 1915.

(12) ITALIEN GEGEN ABESSINIEN. [Italy versus Abyssinia.] Colonel v.Xylander, Retired

The author discusses the operations on both fronts in Ethiopia to include 24 October 1935.

(13) MOTORISIERTE VERBÄNDE UND LUFTWAFFE. [Motorized units and the air arm.]

The author discusses in this article the employment of aviation with motorized units. Speed is essential and the air arm can assist in this by reconnaissances before and during a movement. The mission of aviation before a movement begins would be (a) to locate the open enemy flank; (b) to determine the location of security detachments, barricades and obstacles which would hinder the advance of the motorized units; (c) to determine where the enemy's air defense is strongest. The mission during the advance of the motorized units would be (a) to determine whether the enemy is taking defensive measures against the advance of the motorized units, such as a change in the location of reserves, construction of barricades and obstacles, and increased air defenses; (b) to find out whether it is possible by a change of direction of advance to surprise the enemy and attack him from an unexpected direction. During the advance airplanes should bomb enemy field works and artillery, and attack reserves during their move toward the threatened flank. Since the enemy will use his air force to its fullest extent to protect the threatened point, by bombing the moving motorized units, etc., the author concludes that an air force does not favor either the attack of or the defense against motorized units, but that that side has the advantage which utilizes the greatest number of motorized units and airplanes and especially the side which obtains full cooperation between air and ground.

11 November 1935

(14) NEUGESTALTUNG DER KRIEGFÜHRUNG. [Modern methods of war.] (I)

The author states in this article that everything and everybody bows to the motor, which gives speed and mobility on land, in the air, and on water. He analyses the changes which have taken place since the late War, in which speed was secondary to the results obtained. Today speed is the all-important thing, but this speed and mobility fortunately is not obtained at the cost of results. In fact, results will be obtained to a greater degree, as will be surprise.

(15) DIE ENGLISCHEN ARMEEMANÖVER. [The British army maneuvers.] (See abstract, page 69)

(16) ITALIEN GEGEN ABESSINIEN. [Italy versus Abyssinia.] Colonel v.Xylander, Retired

In this installment the author discusses the Ethiopian and Italian preparations.

18 November 1935

(17) NEUGESTALTUNG DER KRIEGFÜHRUNG. [Modern methods of war.] (II)

In his concluding installment, the author shows how a frontal attack would take place under present conditions.

The attacker will try, by the massing of motorized units at several places, to break through the enemy front as soon as he is sure that he has air superiority. The attack will take place in waves; each wave will be stronger than the preceding one. Armored cars, accompanied by low-flying airplanes, will advance first, in order to make the enemy disclose the location of his antitank weapons. When this has been accomplished, the armored cars and airplanes will attack the guns, while the mass of the artillery will keep down the enemy artillery.

Tanks will advance now, followed by motorized infantry and mechanized artillery, which in turn are again followed by mechanized units and cavalry.

The combination of fire and movement, the attack by waves with increasing strength, is the new method of warfare. The strength of the defense lays in the knowledge that the antitank weapons are superior to the tank. The defense is organized in depth in such a way that the attacker must not know where the main line of resistance is located. Trenches are a thing of the past. In order to prevent surprise, constant alertness and a communications system which connects all weapons are imperative.

If the attacker has broken through, he must find new troops and antitank weapons at a distance of about 7 miles, which necessitates a new attack, during which the original main line of resistance must try to close again. In order to operate with the speed and mobility of modern troops, which is difficult to say the least, high demands are made on leaders for rapid decisions and orders.

(18) DIE LUFTWAFFE ALS TAKTISCHES FÜHRUNGSMITTEL MECHANISIERTER VERBÄNDE. [Tactical leadership of mechanized units by the air arm.] Major Bertkau

According to the author the employment of airplanes for reconnaissance and assistance in the attack of mechanized units is well known, but this can not be said of the employment of the air arm in the tactical leadership of mechanized units. Russia is the only nation who has given the aviation with mechanized forces, as their main mission, the directing and leading of these forces via the shortest route to the decisive point of attack. This, of course, means a close cooperation and coordination of ground forces and the planes.

(19) WAFFEN UND GLIEDERUNG DER TANKABWEHR. [Weapons and organization of antitank defense.]

The unknown author recommends that a battalion should have an antitank platoon of 3 antitank guns and 6 antitank rifles. The reason being that a battalion having to defend a front of 1,000 yards can expect a tank attack by 33 tanks. The battalion will have 150 seconds to combat the tanks. An antitank gun can fire 10 aimed shots and 6 antitank rifles, 20 aimed shots per minute. Therefore 275 aimed shots can be fired during 150 seconds. Assuming that 10% of the shots are hits, 22 tanks will be placed out of action before reaching the 200 yard limit before one front. It is believed that if mine fields are prepared, the casualties among the tanks will be about 100%.

25 November 1935

(20) GEDANKEN ÜBER DEUTSCHE FESTUNGEN UND OPERATIONSPLÄNE. [Views concerning the German fortresses and their influence on plans of operations.] (I) General Wetzell, Retired

This is an excellent article in which the author defends the strategic plans of Count von Schlieffen and his successor, the younger Moltke, against the views of Major Grabau, who advocates the strategic plans of the elder Moltke. The author disagrees with Major Grabau's ideas relative to the construction of fortresses on the various fronts. He states that although the Eastern Front was the major front and the Western Front the secondary front during the time of the elder Moltke, that railroad construction, fortress construction, political alliances, etc., have changed the situation. The French railroads and fortresses have facilitated rapid mobilization on the Western Front, at which place the aid of England and Belgium were assured, whereas the limited railroads and fortresses on the vast Eastern Front would delay mobilization on a grand scale. The author states that fortresses should be constructed on that front where the defensive is to be conducted, that is, the secondary front, to delay or hold the enemy until a decision has been gained on the major front.

(21) DIE FRANZÖSISCHEN MANÖVER MOTORISIERTER VERBÄNDE IN DER CHAMPAGNE IM SEPTEMBER 1935. [The French maneuvers in September 1935.] (See abstract, page 61)

(22) PANZERSPÄHTRUPP-AUSBILDUNG IM KAMPF UM SPERREN. [The training of armored car scout troops in combatting barricades.] Captain Gravenhorst

A brief article in which the author suggests simple methods of simulating types of road barriers in the training of personnel of the armored car scout troops. The title is misleading as the author does not offer training suggestions in combatting barricades.

(23) ITALIEN GEGEN ABESSINIEN. [Italy versus Abyssinia.] Colonel v.Xylander, Retired

This is a continuation of the series of articles by the author on the Italian Army's invasion into Abyssinia (Ethiopia). In this article he reviews the early advances and construction of the road net on the northern front and the Somaliland front. He briefly describes the countermeasures taken by the Ethiopian forces. Of especial interest is the data relating to the receipt by the Ethiopians of weapons, ammunition, and knock-down aircraft from Japan; also the order for 100,000 Mannlicher rifles with 120 million cartridges valued at 22½ million francs, from Czechoslovakia.

(24) ZU "SCHUTZ DER RÜCKWÄRTIGEN DIENSTE." [Protection of the lines of communication.]

The author opens with a statement made by a World War veteran, "the next time barrage fire is placed on the SOS, those at the front can easily indulge in a game of bridge." Replying to the statement that "the development of modern combat means has eliminated the difference between front and rear areas" ("Militär-Wochenblatt," 11 September 1935), he states that the front was and will always be the first protection of the line of communications. The author further states that the line of communications should care for the supply end of the campaign and the front line will take care of the combatant end. He also feels that anyone who believes in improvising a modern supply service defense force is wrong.

4 December 1935

(25) GEDANKEN ÜBER DEUTSCHE FESTUNGEN UND OPERATIONSPLÄNE. [Views concerning the German fortresses and their influence on plans of operations.] (II) General Wetzell, Retired

In this concluding article the author defends the plans of operations of the younger Moltke and the pre-war construction plans of fortifications on the Eastern and Western Fronts. Throughout the article he counters the assertions of Major Grabau, the fortress specialist of Germany, who apparently advocated that the main effort at the outset of the war should have been on the Eastern Front. Major Grabau was a strong advocate of the Rhineland fortifications, especially of Cologne. The author felt that it was useless to fortify Cologne when the German army had planned on forcing a decisive decision on the Franco-Belgian front.

(26) ABWEHR VON GROSZTANKS. [Defense against heavy tanks.]

The author advocates the replacement of the 75-mm. gun by the 100-mm. gun and the utilization of 10 of these per division as a defense against the super-heavy tanks. He states that none of the antitank weapons now available will destroy these monsters but that the antiaircraft cannon and the 100-mm. gun will penetrate the armor of the super-heavy tank. Similarly, the present tank mine fields are inadequate and it would, in his opinion, require a 10-pound mine to disable this type of tank. He realizes that the long range and antiaircraft missions must become secondary in importance in the event of a super-heavy tank attack.

These tanks are vulnerable and the means for their destruction available; therefore there is no need to become unduly alarmed at their development.

(27) MANÖVER: JUGOSLAWIEN 1935. [Yugoslavian maneuvers, 1935.] Major Gaul, Retired

The fall maneuvers held during the period 27 August to 3 October 1935, were the largest conducted by the Yugoslavian Army since its inception. Approximately 30,000 men participated. The author states that when the mobilization order was given, many thought it was for actual war. He states that most of the forces were reserves and that they were systematically equipped and moved to their concentration areas and that during the maneuvers no sickness worth mentioning occurred and that the men were comparable to the regular forces.

The superior northern forces were separated from the southern forces by the Save River. The southern force was to delay to permit time for the mobilization. The northern force chose Brcko for its main crossing and Brezovopoljeno, 9 miles downstream as the feint crossing.

The author states that it required 45 minutes to build the 270-yard pontoon bridge which was composed of 13 sections of 13 pontoons each. On the day of the crossing a fog hindered the aviation and helped the northern forces in their bridge construction. The defenders, by utilizing sector defense, gained sufficient time for the mobilization of its army but the northern force utilized its superiority to carry out an enveloping attack. Both sides made good use of the terrain and the troops performed very well.

(28) ITALIEN GEGEN ABESSINIEN. [Italy versus Abyssinia.] Colonel v.Xylander, Retired

The author reviews the change of command of the Italian northern forces in Ethiopia and gives the military background of the new commander, Marshal Badoglio. He then comments on the military situation on the northern front and the problems confronting the new commander.

11 December 1935

(29) SEEGEWALT IN DER GESCHICHTE. [Seapower in history.] (VI) Rear Admiral Meurer, Retired

This article comments on the astounding rise of Japan to the role of a major naval power of the world in forty years; whereas England required one hundred fifty years to become a sea power. This remarkable rise, according to the author, was accomplished despite all the opposition and jealousy of the white nations bordering the Pacific and those interested in the Orient. This was possible, he states, due to Japan's peculiar geopolitical, strategical naval and maritime location. Admiral Meurer discusses the mental attitude of the Japanese which fostered the national desire to become a supreme maritime nation. The Chino-Japanese War and the Russo-Japanese War are discussed with the territorial gains and interferences with further territorial occupation by European nations. Since the World War, Japan's position in the Far East has become more dominant and she has now proclaimed a "Monroe Doctrine" of her own for that sphere of influence.

Japan can best be described as a people without land and land without raw products. Its fast increasing population requires an outlet on the mainland and its industries need raw products. The old proverb, "He who controls the sea will soon control the land," may soon come true in the Far East.

(30) STELLUNGSKRIEG ODER BEWEGUNGSKRIEG? [Position warfare or war of movement?] Brandt

As time passes the greater becomes the conviction that the next war will be a war of movement. In this article the author cites views which express the attitude of nations as to the next war, but he believes that conditions alone will dictate whether it will be position or mobile warfare. He discusses the various vital points which enable a war to continue for a definite period, such as oil supply and procurement, money, industry, etc. Aviation claims that the next war will be of short duration, as the air forces can wipe out entire industrial districts and thus cripple the supply of the combatant forces. The author reminds the reader of the promises made by the submarine advocates, whereby nations would be starved into submission and supplies prevented from reaching the enemy forces. Likewise, too much faith should not be placed in the aviation promises. The author feels that the development of the super-heavy tank in great numbers, with armament sufficient to repel the projectiles of the average field piece, will furnish the solution to maintenance of mobile warfare. The cost per ton of the 100-ton tank is about the same as the cost per ton of a warship; therefore, 100 super-heavy tanks will cost about the same as a 10,000-ton cruiser. The author's motto is, "use the super-heavy tank to prevent position warfare."

(31) REITER-BATAILLONE? [Mounted battalions?] Captain v.Woedtke, Retired

Commenting on Captain Gerhard's article in the 18 October 1935 issue of "Militär-Wochenblatt," relative to mounted battalions for infantry

divisions, the author asks: Why does an infantry division need cavalry? Surely only for reconnaissance and not to fight. He then discusses the organization of a cavalry division reconnaissance detachment with the attachment of various weapons and services. He suggests the following organization for the reconnaissance detachment:

Staff with communications platoon of one light radio set, three pack sets, and one telephone contact set
2 cavalry troops
1 heavy machine gun platoon (pack transportation)
1 light trench mortar platoon (pack transportation)
1 engineer platoon (equipment carrier on pack animals)
1 antitank platoon of 3 guns.

The organization would cut Captain Gerhard's organization in half and could be made up of reserve personnel since their mission is not a fighting mission. The commanders and platoon leaders should be from the regular army.

(32) LUFTÜBUNGEN IN ENGLAND. [British air exercises.] Lieutenant Feuchter, Retired

An article describing the air exercises over the London and Portsmouth areas to test the air defenses of these locations. The author states that the new Heyford Bomber (Handley Page manufacture) introduced new complications to the ground defenders because of its great speed and high altitude flying. The British use the "Camera obscura" to record the hits of the bombers. Planes released smoke signals by day and light signals at night at the moment of theoretical bomb release. Registration on the "Camero obscura" of these signals constituted hits.

Weather was very unfavorable for the defenders, as clouds at 1,800 feet altitude or light ground fog covered the area the first day, masking ground observation but permitting the attackers to carry on. The second day a heavy ground fog was disadvantageous to both as it prevented the bombers to land at home fields and compelled emergency landings on "enemy" fields. The mist did not interfere with the attackers but prevented ground observation, being just dense enough to prevent penetration by searchlights. Due to the great speed of the bombers the defenders changed their previous tactics as to the use of pursuit aviation. Instead of locating them at the frontier they placed them at the objective. The "day and night patrol" planes, equipped with wireless telephone, rendered excellent service above the cloud and fog barrier.

On 14 August the air exercises at Portsmouth, Southampton and Gosport tested the antiaircraft defenses which necessarily eliminated friendly pursuit aviation. Despite the use of 50 searchlights the defenders could not hold the attacking planes in their beam due to the ground mist. The new bombers with sound silencers made detection by the sound ranging difficult and the glide-diving tactics with changes in course during the descent offered new difficulties to the antiaircraft guns.

The difficulties encountered by the searchlights due to the fog and mist which is prevalent in England, strengthens the need for development and use of the infra-red rays to locate aircraft in this region.

(33) ITALIEN GEGEN ABESSINIEN. [Italy versus Abyssinia.] Colonel v.Xylander, Retired

A continuation of a series of articles by the author on Italy's forces and activities in her Ethiopian enterprise. In this article he discusses the oil problem and the military situation on 28 November, when Marshal Badoglio assumed command.

(34) GEPÄCKERLEICHTERUNG BEI DER HOLLÄNDISCHEN INFANTERIE UND MOTORISIERUNG DES GEFECHTSTROSSES. [Reduction of weight of pack and the motorization of the combat trains in the Dutch Army.]

This article comments on the action of a commission appointed to formulate a method to reduce the infantryman's load to 55 pounds. They recommended that the infantryman's load be divided into three categories, namely: (a) Marching equipment limited to that actually required on the march. (b) Combat equipment which will be carried on the combat train during the march and which will be issued just prior to combat. This consists of entrenching equipment, sand bags, hand grenades, communica-

tion equipment, light machine guns, and such ammunition and weapons as are not required for march protection. The animal-drawn combat train was not entirely eliminated. Each man was to have 60 rounds as it was considered that their fire was to augment the machine gun fire only. (c) The remainder of his equipment would be left on the vehicles. This would consist of packs, overcoats, etc., and would be carried by vehicle or issued by order of the brigade commander. Part of the combat train would be motorized and every effort would be made to progressively motorize the entire train. This would give the troops greater mobility and marching capacity and would also protect the combat train which would require less road space and be able to move with greater speed from cover to cover, thus eliminating the hazard of air attacks.

18 December 1935

(35) PANZERTAKTIK. [Tank tactics.] (I) General v.Eimannsberger

The author states that due to the rapid development of tanks and armor since the war, tank tactics are based on theory rather than experience. The tank and antitank development has lagged behind that of aviation. The author considers that the mission of tanks is twofold: one to accompany infantry and the other to use them as a unit in attack. He states that in future wars tank attacks will be the rule rather than the exception and that the infantry must bear the brunt of the attack. The defense must be elusive, making the best use of its organic weapons and natural obstacles. Scattered mine fields are a great help to the defense.

The author presents ballistic data showing how many shots striking a tank are noneffective due to the angle of impact causing deflection of the projectile. He also provides ballistic tables showing the armor which can be penetrated at various ranges at certain angles of impact by the 47-mm. infantry cannon and the 20-mm. antitank rifle. He doubts whether the present-day antitank weapons are effective enough, giving as an example the inability to pierce the Renault NC 27.

Since tanks will attack the flanks and rear after their breakthrough, the author recommends a defense in which the antitank defense is grouped rather than acting individually. He also discusses the protection of a marching column against tank attacks.

(36) DIE MILITÄRISCHE BEDEUTUNG DES DREIBUNDES FRANKREICH, SOWJETUNION, TSCHECHOSLOWAKEI. [The military significance of the triple alliance, France, Soviet Russia, and Czechoslovakia.]

An anonymous article describing the political and military alliances of Europe since the World War. The author comments on the anti-German alliances fostered by France to isolate Germany and forge a ring of hostile neighbors about her. The 10-year nonaggression treaty with Poland counteracted France's influence in that sector. Italy's air menace and expansion policy in the Danube area has caused France much worry, and efforts to conciliate Italy have failed. France likewise has failed to bring Rumania into her group of allies. The rearmament of Germany has forced her to reestablish relations with Russia, even though under a Communistic regime. The anti-German alliances now consist of France, Soviet Russia, and Czechoslovakia. Czechoslovakian troops have been French trained and French dominated. Japan's Far Eastern threat will hold a third or fourth of Russia's forces in the Orient. The author discusses the air threat and tank threat to Germany which this new Franco-Russian alliance contains.

(37) ITALIEN GEGEN ABESSINIEN. [Italy versus Abyssinia.] Colonel v.Xylander

This is a continuation of a series of articles by the author on the Italo-Ethiopian dispute. He presents the situation on the northern and southern fronts during the early weeks of December, describing the Italian efforts to consolidate their positions on the northern front. He also describes the efforts of the Ethiopian tribesmen to flank the northern and southern positions. Furthermore, he mentions the activities in the British Sudan, Italian Libya, and British Somoliland.

25 December 1935

(38) PANZERTAKTIK. [Tank tactics.] (II) General v.Eimannsberger

This is the continuation of a previous article in which the author stressed the antitank defense. In the present article he discusses the tank attack, which he divides into two types: first, in which the tanks accompany and support an infantry attack, and second, in which the tank units are engaged as an independent unit but in cooperation with the other arms. He discusses their operative mobility, utilization, organization, etc. The type of armament is of great importance in combat where both the cannon and the machine gun are sorely needed. The American tank is favored in this respect in that it contains both weapons. The author stresses the cooperation of all weapons in the attack, especially so immediately after the penetration of the hostile lines by the tanks.

In his summarization the author states that a tank attack is not an attack by tanks, but an attack by a combination of arms of which the tank is one.

(39) DER DURCHBRUCH VON SEEHÖHE AM 18. 11. 1914. [The breakthrough at Seehöhe on 18 November 1914.] Heinemann

Unsuccessful enterprises sometime provide excellent lessons for future conduct. Thus the author introduces this article which describes the events of the German forces in Poland during the fall campaign in 1914. At that period the German Ninth Army was conducting its fall campaign while the numerically inferior German Eighth Army had to withdraw to the Lötzen—Angerapp position. This was a strong natural position prepared by a civilian army for defensive purposes. The garrison for this position consisted of Landwehr and Landsturm troops. They were not prepared for combat at this time, being poorly dressed and equipped, possessing no field kitchens and few officers.

The enemy decided to make his main effort between Spirding and Löwentin Lakes. The old men comprising the German garrison suffered so much from the changeable weather that they had to be relieved at frequent intervals. These reliefs were so conducted that units were split and entirely strange battalions would be in support or reserve for the units in the front lines. Command became difficult in this confusion of units. The Russians tunneled under the German positions and suddenly overran the Germans, driving them from the isthmus between the two lakes. The author gives several lessons based on the above, some of which follow:

Compartments of terrain should, where possible, be occupied by the same units.

Twenty-four hour reliefs defeat the desire for reconnaissance, security service, or construction of defense works.

The best counter-activity against hostile tunneling would have been counter-tunneling, counterattacks, and harassing fire.

All heavy guns should be registered, loaded and ready to fire on threatened points.

At night and during fog, troops should be alerted to prevent panic.

Reserves must be kept together and not scattered.

The poorer the troops the more necessary that a firm and energetic commander be in command.

(40) DIE BEWERTUNG, DIE AUFGABEN UND DIE TAKTIK DER JAGDFLIEGEREI. [The value, the mission, and the tactics of pursuit aviation.] Colonel Nagel, Retired

In this article the author comments on the difference of opinion as to the value of pursuit aviation as compared with the multiple-seater combat plane. He cites the French, British, and Belgian sources in favor of the latter type. He also comments on the extraordinary speed, altitude, and bombing accuracy of the modern bombers and the difficulty encountered by pursuit to combat these bombers.

The author discusses the French system of barrier aviation and its coordination of ground and air units, intercommunication and alarm systems. He also mentions the mission of certain ships to locate hostile aircraft either by direct action or by cruising in the vicinity of aircraft which are performing reconnaissance, artillery observation, and other duties. The combat tactics of Fonk, the French war ace, are discussed

and the author comments on the difficulty of such tactics against modern heavy aircraft which is usually heavily armed. The mass attack tactics, where many planes are in formation, break formation and single out a hostile plane as a target, engage it, and reform, is also discussed. The retention of a reserve is a new thought whereby those bombers which are forced to break formation by the leading attack formation, are singled out and destroyed.

(41) VERWENDUNGSMÖGLICHKEITEN MOTORISIERTER PIONIERE. [The possible employment of motorized engineers.]

The author feels that motorized engineers will arrive at their destinations less fatigued and with a greater amount of material than if marching with animal-drawn transportation. In the war of the future they must remove obstacles, barriers, etc., that will be used by an enemy, also roads damaged by bombers or long range shelling must be rapidly repaired. The numerous functions, such as bridge repair, ponton bridge construction, laying mine fields, construction of antitank defenses, etc., are discussed by the author. He emphasizes the necessity that the engineers must keep up with the fastest combatant units and should be able to move rapidly toward a threatened area.

(42) DER INFANTERIE-KAMPFWAGEN. ERFAHRUNGEN AUS DEN DIESJÄHRIGEN ENGLISCHEN MANÖVERN. [The intantry tank. Experience based on the British Maneuvers, 1935.] (See abstract, page 73)

4 January 1936

(43) DIE EINWIRKUNG DER FESTUNGEN LÜTTICH, NAMUR, MAUBEUGE UND ANTWERPEN AUF DIE OPERATIONEN 1914 IM WESTEN. [The influence of the fortresses of Liege, Namur, Maubeuge, and Antwerp on the German operations in 1914.] (See abstract, page 85)

(44) TANK GEGEN TANK. [Tank versus tank.]

The author states that tank units combating tank units is almost impossible because the defender's ground weapons would soon oppose the hostile tanks. He comments on the need for optical equipment to enhance the firing possibilities of tanks. The best combat tactics, according to him, when one tank meets another, is to instantly halt and fire. He mentions that authorities doubt if a moving tank can hit a target, whereas stationary guns can register with ease on moving tanks. At present smoke produced by tanks interferes with their firing as well as that of the enemy.

(45) ITALIEN GEGEN ABESSINIEN. [Italy versus Abyssinia.] Colonel v.Xylander

In this article Colonel v.Xylander discusses the preparations made by the Italians for the expected Ethiopian offensive and then describes the beginning of the Ethiopian offensive on the Takazze River front.

11 January 1936

(46) PARIS UND VERDUN. IHRE EINWIRKUNG AUF DIE SEPTEMBER-OPERATIONEN 1914. [Paris and Verdun. Their influence on the September 1914 operations.] Major General Klingbeil

The author states that the rapid capture of the Belgian, Russian, and Northern French forts gave the erroneous impression to the average man that these served no purpose. He therefore describes the influence of the Paris fortresses and Verdun on the operation plans. According to the author, those of Paris indirectly effected these plans in that they served as a screen and debouching point from which the French flank attack halted the movement of the German right army wing. The fortress of Verdun critically curtailed the German efforts to hit the French Fifth Army from the rear.

(47) KAMPFWAGEN UND FUSZVOLK. [Tanks and infantry.] Braun

The author states that the tank experiences of the Chaco and in Ethiopia are of great importance even though they are not conducted under European conditions. He also debates the question as to whether, in mixed tank attacks, the medium tank should precede the light tank.

(48) ITALIEN GEGEN ABESSINIEN. [Italy versus Abyssinia.] Colonel v.Xylander

The author describes the fighting in the north during the Christmas period between Mai Timchet and Dembegina Pass where the Italian right flank was forced back. He states that at the close of the year 1935 all the Italian armies were on the defensive. He also discusses the seriousness of the oil situation of Italy.

18 January 1936

(49) INFANTERIST UND PANZERABWEHR. [The infantry soldier and antitank defense.] Major v.Siegroth

The author describes a maneuver in which tanks and armored cars participated with the infantry forces. Based on his observations he arrived at the conclusion that unless the infantryman is provided with a light weapon capable of penetrating tank armor at 200 yards, it will be impossible for even the best infantry, after nerve-racking advancing by bounds until almost on their opponents, to hold their positions, should a tank suddenly appear before them as happened in these maneuvers. It would be impossible to seek cover against the tank, and death or panic would be inevitable unless some such weapon is provided which will give the infantryman an assurance that he can combat the tank with a reasonable chance for success.

(50) DIE ANSICHTEN DER FÜHRENDEN MILITÄRMÄCHTE ÜBER DIE VERWENDUNG DER LUFTWAFFE IM ERDKAMPF. [Views of the leading armies as to the use of aviation in a terrestrial battle.] Colonel Nagel, Retired

The author comments on the possibilities of the low-flying "hedge-hopper" plane in assisting the ground troops in battle. Various armies advocate that these planes travel 3 to 5 yards from the ground as minimum, and from 25 to 50 yards as maximum, traveling at high speed. By careful use of camouflage and terrain features they can reach their targets, giving the ground troops only 30 seconds to 2 minutes warning from the time the motor sounds are detected. This may be reduced by the new motor silencers. Their speed keeps them only 15 to 60 seconds in sight. Anti-aircraft weapons cannot fire on them because of the flat trajectory, pursuit aviation cannot attack because of the low altitude and ground fire is at a minimum. The pilot with his fixed machine guns can rake the ground troops without depressing the nose of his plane and bomb them with remarkable results.

After the War these tactics were practiced in colonial warfare with success. In Manchuria the Japanese suffered heavy losses (1 out of 3 planes). The Italians have lost but few planes from ground fire. The Bolivians were quite successful against Paraguayan supply columns and marching columns.

(51) ERFAHRUNGEN MIT TANKS UND PANZERWAGEN IM POLNISCHEN HEERE. [Experiences with tanks and armored cars in the Polish Army.]

An article on the various technical requirements of tanks and armored cars, such as types of springs, treads, oil, grease, fuel compartments, armor, etc. He also discusses the radiators, ventilators, filters, and compartmenting of the inner portion of the vehicles.

25 January 1936

(52) ZUR NORDOST-OFFENSIVE IM SOMMER 1915. [The northeast offensive during the summer of 1915.] General v.Gallwitz, Retired

The author defends his plan of offensive of August 1915 whereby the German Eighth and Twelfth Armies were to drive south and southeast in conjunction with Mackensen's drive north with the Fourth, Eleventh, and First Armies to pinch out the Russian armies in the Bug River salient. He asserts that on account of the favorable position of the German armies, his plan to cut off and capture the Russian XIV Corps located there was better than the Ludendorf sponsored drive over Kovno—Vilna on the north. He also debates the wisdom of changing the direction of the Eighth Army's attack from south to east.

(53) GEPANZERTE KRAFTFAHRZEUGE FÜR AUFKLÄRUNGSZWECKE. [Armored motor vehicles for reconnaissance purposes.] (I) Major Rothardt

In the discussion of reconnaissance a decision as to type of transportation to be used is necessary for a distant reconnaissance (strategic) and close-in reconnaissance (tactical).

Distant reconnaissance demands that great distances be covered in the minimum time; therefore speed is essential. Nevertheless, a decision must be made whether a road-bound vehicle or cross-country type be used. A vehicle possessing both these features would be too costly; therefore most countries are utilizing armored commercial chassis for this purpose.

Major Rothardt describes three types of armored cars according to weight and armor, commenting on their armament, armor, speed, mobility, crew, equipment, etc. He also comments on the advantages and disadvantages of the various features of these vehicles.

(54) ITALIEN GEGEN ABESSINIEN. [Italy versus Abyssinia.] Colonel v.Xylander, Retired

This article is one of a series of articles which have appeared previously. The author presents data on the Italian organization and of the situation on the Tembien front during the early part of January. He also comments on the activities in Webbe Schelbeli district on the southern front during the same period. All the data has been derived from Italian sources.

4 February 1936

(55) DER ARTILLERIEANGRIFF. [The artillery attack.] General v.Eimannsberger

This article contains a rebuttal to Major Walter Reinke's article, "Mass Employment of Artillery," which appeared in the "Artilleristischen Rundschau," October 1935, in which Major Reinke took exception to General v.Eimannsberger's ideas on the employment of artillery in the future. General v.Eimannsberger is still of the opinion that the artillery function is to destroy or silence the hostile artillery prior to the infantry attack and keep down the automatic weapon fire until the assaulting infantry can come to grips with them. He advocates a closer cooperation of all weapons with a thorough understanding of each other's difficulties and the elimination of all branch animosities.

(56) GEPANZERTE KRAFTFAHRZEUGE FÜR AUFKLÄRUNGSZWECKE. [Armored motor vehicles for reconnaissance purposes.] (II) Major Rothardt

In this second installment on armored motor vehicles, the author discusses the cross-country ability of armored cars. These he divides into three classes: the two-axle, three-axle, and multiple-wheel vehicles. Each of these types are analyzed as to weight, armor, armament, mobility across country, maneuverability speed on and off roads. Their use as reconnaissance cars is discussed by the author. He also comments on the possible use of the track-laying vehicles and half-track cars for reconnaissance missions because of their exceptional performance off roads.

(57) FRANKREICHS WEHRWIRTSCHAFT. [The French war industry.] Captain Ruprecht, Retired

The World War demonstrated that the lack of war industries or its failure to function can lose a war for a nation. France, according to the author, is a country consuming vast military supplies and its war industry is of vital value to her as it is of vital interest to Germany.

France is organized so that all industries which can serve the military establishment can be conscripted, also all required personnel and supply necessary to serve these industries can be conscripted and finally regulations for the organization and management of these industries have been prepared by law. Control, during a national emergency, over such vital products as coal, iron and oil, has been included in the French law. During the past year France has become independent of Germany for its supply of coke and coal, as French Morocco is now in the position to furnish 300,000 tons of lump coal. France being a great iron ore country, has no worry for procurement of this vital product. It is rumored that oil has been discovered in Madagascar in sufficient quantities to provide France in an emergency. She also has created a vast oil reserve for her army and navy. France lacks lead, zinc, and copper, which must be imported.

The factories of France have been prepared to expand and increase their production in case of a national emergency; for example, its present

aircraft production capacity of 1,300 twin-motor planes can be increased to 4,000 per year.

(58) ITALIEN GEGEN ABESSINIEN. [Italy versus Abyssinia.] Colonel v.Xylander, Retired

In this article the author describes the battle of Ganale Doria which took place 12 January 1936 on the southern or Dolo front. Here the Italians met the Ethiopians in force but were unable to outflank them because one flank rested on British territory (Kenia) and the other on the Webbi Schebeli valley. Tanks were used to pave the way for the "Dubats," native forces, that formed the advance guard. The author gives an excellent description of this battle. The latter part of his article is devoted to mobilization of new units and the surgeon general's report.

11 February 1936

(59) MASCHINENGEWEHRBEKÄMPFUNG IM ANGRIFF. [Combating machine guns in the attack.] General Reinicke, Retired

The author, commenting on experiences with machine guns during the War, indicated that on many occasions isolated machine guns remained intact after the barrage lifted enabling these guns to sufficiently delay the attackers to permit reserves to move up and fill in the gaps created by the artillery fire and thus reestablish the line. As a solution for this he recommends attacking troops of high quality plus possession of a weapon that will not only hold down the hostile machine guns but will destroy them. The new minenwerfer is just such weapon but it lacks the nerve racking explosion of the French 75-mm. gun. He therefore recommends a cannon or howitzer for this purpose, which will not only have this nerve racking explosion, but will destroy the machine gun protective covering. One of these should be with each company to avoid the delay in bringing them up and therefore accelerate the advance.

(60) ZUR FRAGE DER KORPSARTILLERIE. [The need of corps artillery.] Lieut. General Marx, Retired

The author, after discussing the employment of long range guns, comes to the conclusion that there is no real need for corps artillery in mobile warfare, but as soon as position warfare is taken up, the need of corps artillery is vital.

(61) HINHALTEND . . . [Delaying action.]

The author, in discussing the delaying action, calls it one of the most difficult phases of military tactics being conducted as a rule by the weaker force. By weaker force he does not mean absolutely weaker, but weaker at that definite point. He also states that wherever possible this delaying action should not be conducted by the active or regular forces, but by the frontier forces, the landwehr or landsturm reserving the regular troops for the attack missions. He states that great care must be taken in the training for this type of combat to avoid premature severance of combat and withdrawal. He accuses the infantry of not conscientiously defending a position and that the soldier develops an erroneous conception of delaying action. He feels that they should be able to hold for hours, even days, before moving back. Because of the danger of misconceptions the author advocates less delaying action training and more attack training.

(62) DER EINSATZ DER PANZERWAFFE. [The use of the tank as a weapon.]

The author opens with the statement that wherever the hostile tank appears it becomes the focus of the attack and all weapons are directed against it. Fire-power, speed, and armor protection constitute the strength of a tank and to retain its effectiveness these must never be separated. Following this statement the author continues that in his opinion the tank can not adjust its speed to the infantry but that the infantry must adjust itself to the tank. He also disapproves of the idea of a tank battalion per combatant regiment. He feels that tanks must be utilized in mass at locations which favor maximum tank success and that by their penetration at that point their success would give flanking support to the neighboring infantry where tanks had not been used. He favors their use to break down counterattacks and when necessary, to combat tanks with tanks. He feels that the accompanying guns and trench mortars should

assist the infantry to destroy the machine-gun nests which the tanks had missed in their advance.

(63) ETWAS ÜBER DIE FRANZÖSISCHEN MANÖVER DER MOT. VERBÄNDE IM SEPTEMBER 1935. [Conclusions based on the French maneuvers, 1935.] Captain Gerhard (See abstract, page 67)

(64) ITALIEN GEGEN ABESSINIEN. [Italy versus Abyssinia.] Colonel v.Xylander

This article gives an account of General Grazianis' advance on the southern front in which he was able to leave the unhealthy lowlands and enter the plateau country which gradually rises to the great African escarpment. The author describes the terrain conditions which will necessitate a change in campaign methods and the difficulties which will henceforth be analogous to that confronting the northern army. He states that the aviation serving the southern army carried out 141 bombing missions in 9 days, dropping approximately 4 tons of bombs; eighty of these flights covered 248 miles. Prior to the tank attack on Neghelli, 26 planes had bombed the town, reducing the resistance for the attack. The author notes the effect of the above on the Ethiopian morale and how it improved Italy's political position. He also discusses the British armament in Egypt and the Italian armament in Libya.

18 February 1936

(65) AUS GROSZER ZEIT VOR ZWANZIG JAHREN. CASTELNAU UND VERDUN. [Twenty years ago: Castelnau and Verdun.]

An excellent description of the serious situation which confronted the French at Verdun in February 1916. General v.Falkenhayn was determined as a matter of prestige to capture Verdun. His attacks over the Woëvre plains drove the French back and caused General de Langle to issue orders to evacuate the Woëvre plains and the Verdun salient. Marshal Joffre permitted the French withdrawal as far as the Meuse and stated that this line was to be held but that General de Langle, being on the ground, could best decide what to do. General de Langle, taking advantage of this, ordered the retreat beyond Verdun leaving the city to the enemy. Here General Castlenau, the chief of staff, stepped in and requested that the command be turned over to General Pétain, as he was the only one who had faith that the Germans could be stopped. Securing permission of Joffre to personally reconnoiter the front lines and give orders in Joffre's name, he departed and countermanded all orders for the withdrawal and urgently requested Pétain to take command. This was done and a counterattack started and the salient and Verdun were saved to the French. The cost in lives by both sides was terrific, but the moral effect on the French Army, that its greatest fort withstood the German attack, was worth the cost.

(66) ABWEHR VON GROSZTANKS. [Defense against super-tanks.]

An article in which the author takes exception as an artilleryman to an article which appeared under the above title in the 4 December 1935 issue of the "Militär-Wochenblatt." He admits that it is time that the super 90-ton French tank is equipped with 55-mm. armor plate in front which is immune to the fire of small caliber antitank guns, and can hardly be penetrated by field pieces at comparatively close range. He agrees that it will require a 100-mm. cannon with high initial muzzle velocity (provided it is supplied with armor-piercing munitions), to penetrate this armor. The author feels that the antiaircraft guns could be able to perform these missions without calling on the division artillery for help as the latter has missions of its own.

The author admits that when a super-tank attack is supported by aviation, the tank represents the greatest danger, but questions the wisdom of utilizing the antiaircraft weapons as antitank defense weapons. He feels that the division should be adequately equipped with antitank weapons to meet these emergencies. The author disagrees with the idea of altering the division artillery in type, construction, and munition, to meet the tank menace. He feels that this is needless and too expensive and wasteful. In his opinion the division artillery is capable of performing the normal missions assigned to it and that special antitank weapons should

be developed just as antiaircraft weapons had been developed to meet the specialized tasks.

(67) HEERESFLIEGER. [Army aviation.] Colonel Nagel, Retired

The author states that even Douhet, the renowned advocate of absolute air warfare, had to admit that the modern army is dependent on service squadrons. These constitute the rapid communication and transportation service and are about as indispensable to the army as the combatant aviation which supports the ground efforts from the air. The author describes the functions of the army aviation with its distant reconnaissance and the corps aviation with its close-in reconnaissance. He also reviews the missions of the aviation functioning with the artillery, infantry, and tanks, in addition to the missions of the reconnaissance and service aviation.

(68) ITALIEN GEGEN ABESSINIEN. [Italy versus Abyssinia.] Colonel v.Xylander, Retired

In this article the author reviews the concentration of the forces of Ras Seyum and Ras Kassa in the rugged Tembien district. He describes the counter-measures taken by Marshal Badoglio and the four days of fighting which occurred 20-24 January. The Italian offense turned to a desperate defense in which the militia was saved by the timely arrival of the Askaris troops.

25 February 1936

(69) UM DIE TANKSCHLACHT VON CAMBRAI. [The tank attack at Cambrai.] Captain v.Köller, Retired

The author gives an interesting description of the tank attack at Cambrai where the front-line soldiers with a few cannons, hand grenades, and machine guns, courageously stopped the tank wave that was to overrun them. The author describes how the men of the German 54th Infantry Division crawled on and under the tanks, and how they placed explosive charges made of grenades tied together, under the tracks. He describes the artillery moving into the open to fire on the tanks by direct fire and the example set by the officers to inspire confidence. The article portrays a different picture of the battle which normally is painted as a scene of panic and fright.

(70) WESEN UND BEDEUTUNG DER ENGLISCHEN TERRITORIALARMEE. [The character and purpose of the British Territorial Army.]

The author comments on Kitchener's adverse attitude toward the Haldane Territorial Army which was seven years old at the outbreak of the World War. He classified it as a second-rate militia and disregarded it for war service. He planned in its stead an army of volunteers and conscripts. Urgent necessity forced the British to call on them for help, and after one month's training the 42d Territorial Division arrived at the front on 19 August 1914. Kitchener's Army was unable to send a division until it had 8½ month's training. Territorials had 19 divisions in France. They were used behind the lines until the spring of 1915 and then took part in the summer campaigns. Without them the British would have been unable to hold Flanders. Since the war they have been reorganized so that now the regular army will be the advance guard and the Territorials the main body and the conscripts the reserves. They can only be used as long as they retain their identity and cannot be used as regular army replacements. They are trained for antiaircraft service, coast defense, etc. At present they are a big factor in the British defense scheme.

(71) DIE LAND- UND LUFTMACHT DER SOWJETUNION. [The land and air forces of the Soviet Union.]

Marshal Tuchatschewskij, in January 1936, at the Soviet Congress, announced a radical change in the organization of the army. Of a total of 84 infantry and 12 cavalry divisions there were 28 and 6 respectively so-called cadre divisions with personnel of several years' service. The other 56 infantry divisions and 6 cavalry divisions consisted of territorial troops serving only for several months. This ratio was changed to 64 infantry and 9 cavalry divisions to be used as cadre divisions, and 20 infantry and 3 cavalry divisions as the territorial (militia).

This increase of divisions will increase the peace-time army from 960,000 to 1,300,000 men. This expansion and increased training will greatly increase the combat power of the Soviet army, especially along the border districts where they will be garrisoned.

The author then comments on the organization of the corps and divisions and the various services giving their special armament and special features. It is the intention of the Soviet Union to follow this army expansion by an expansion of its fleet and then an increase and improvement of its railroad net and industrial mobilization.

4 March 1936

(72) ERFAHRUNGEN BEI TRUPPENVERSCHIEBUNGEN WÄHREND DES WELTKRIEGES. [Lessons derived from the movement of troops during the World War.] Major Kretzschmann, Retired

The execution of the first troop movements at the outset of the War closely adhered to the concentration plan prepared during peace time. The preparation of march graphs and tables traced in detail the procedure of the transports from the time of their loading to their destination, noting all halts, etc. This method of movement of troops soon proved worthless due to inadequate entraining points, interruptions, and other delaying features which presented themselves in the hostile country. Also it often occurred that units would report for transportation with an excessive amount of equipment or an excess over their allocated allowance in horses, vehicles, etc. Such incidents upset prepared traffic plans. The author describes all these difficulties and their solutions as the War progressed. He mentions the necessity of conducting the troop movements, especially the loading and unloading at night due to the increased hostile air activity. During the latter part of the War troops furnished their own protection against aircraft by setting up machine guns on flat cars utilizing special mounts. Deceptions in troop movements were used to deceive the enemy of the real destination of the movement.

To have successful troop movements the author states that punctuality must be insisted upon and that troops conform with regulation loads.

(73) VERWENDUNGSMÖGLICHKEITEN MOTORISIERTER MG.-BATAILLONE. EINE UNTERSUCHUNG AN BEISPIELEN AUS DEM BEWEGUNGSKRIEG. [Employment of motorized machine gun battalions. An analysis of historical examples of mobile warfare.] Captain Ponath

An abstract of this article will be published in the next issue of the "Review of Military Literature."

(74) VERWENDUNG DER LUFTWAFFE IM ERDKAMPF. [Use of aviation in ground battle.] Lieutenant Gravenhorst

The author comments on the necessity of specially constructed planes for the hazardous mission of low flying over hostile troops. He also advocates the use of light armor on these planes, not only to physically protect the pilots but also to give them a feeling of security which will result in better work. In his opinion grenades or light bombs are better than machine gun fire against a ground enemy.

(75) ITALIEN GEGEN ABESSINIEN. [Italy versus Abyssinia.] Colonel v.Xylander, Retired

The author describes the operations of General Graziani in the province of Sidamo. He states that the Italians used 1,100 trucks in the column operating there. All white troops traveled by trucks and the "Dubats" or native troops marched. The column consisted of 7,000 men and carried rations and water for 14 days; that is, 300 tons rations, 13,750 gallons of water in 60 tank trucks in addition to 150 tons of ammunition supply. Due to the difficulty of the terrain the column used twice as much fuel as estimated (250 tons). When it arrived at Neghelli, after furnishing 1 quart of water per man per day, the column still had 2,500 gallons left. Here the water supply was replenished at the springs which were restored and pumps installed.

Colonel v.Xylander describes the mopping-up operations and the expedition to Mt. Berbissa—Tuto and to Allata on the road leading to Addis Ababa. He comments on the road construction and aircraft supply in the north. General Badoglio's February activities in the Tembien area

are discussed by the author who describes the fighting that has taken place in this region. The high plateaus with their vast ravines and chasms have made progress very difficult.

MILITARY ENGINEER

March-April 1936

(1) INCENDIARY AGENTS. Lieut.Colonel Prentiss

Colonel Prentiss first discusses the history of incendiary agents, followed by a technical discussion of spontaneously inflammable materials, metallic oxides, oxidizing-combustible mixtures, and flammable materials, which in turn are followed by a short view of the author on the future of incendiary weapons.

(2) FLOOD WARNING SYSTEM AT MADDEN DAM. Kirkpatrick

(3) DEVELOPMENT OF MODERN TIMBER CONNECTORS. Captain Combs

(4) RELATION OF RAINFALL TO FLOOD RUN-OFF. Colonel Pettis

(5) PARALLAX AND STEREOSCOPIC VISION—AS APPLIED TO MAKING MAPS FROM AIR PHOTOGRAPHS. Lambert

(6) THE CAVALRY SCHOOL. Brigadier General Henry

A history of the Cavalry School at Fort Riley, Kansas.

(7) EXPLORATIONS OF DE SOTO. Colonel Fordyce

(8) DRUM GATES AT MADDEN DAM. Hersh

(9) HISTORY AND DEVELOPMENT OF CAMP RIPLEY. Major Bettenburg & Captain Miller

(10) STRATEGIC MINERAL SUPPLIES. 6. TIN. Major Roush

(11) DIFFERENTIAL UPLIFT IN GREAT LAKES BASIN. Captain Canan

MILITARY SURGEON

April 1936

(1) THE CENTENNIAL OF THE WORLD'S LARGEST MEDICAL LIBRARY: THE ARMY MEDICAL LIBRARY OF WASHINGTON, FOUNDED 1836. Major Hume

(2) THE FIRST RESERVE OFFICERS CAMP. Colonel Coe

(3) ORGANIZATION AND FUNCTION OF THE MEDICAL REGIMENT. Captain Kirk

NAVAL INSTITUTE PROCEEDINGS

March 1936

(1) GERMAN NAVAL HISTORY OF THE WORLD WAR. Lieutenant Krause

A short study of the German Navy during the World War, in which the author brings out that the High Seas and Baltic fleets operated as independent commands. The Chief of the Naval Staff was only an adviser to the Emperor and instead of being the directing head of the Navy, seemed to function almost solely as a central bureau for the transmittal of information. Since there was no unity of command, naval affairs drifted aimlessly until August 1918, when Admiral Scherr took over the duties of Chief of Naval Staff. He accepted the appointment only on the condition that he would be the active directing head of the Navy.

The author discusses also the military thought in naval warfare, war and policy, and finally, war propaganda.

(2) HISTORIC SHIPS OF THE NAVY, "CONGRESS." Neeser

(3) HUMAN ENGINEERING AND THE NAVY. Lieut.Commander Lincoln

(4) AIRSHIPS FOR NAVAL SERVICE. Hovgaard

(5) NAVAL RADIO IN AFRICA. Lieut.Commander Hughes

(6) AN AMAZING DEMONSTRATION OF WATER AS FUEL. Captain Jessop

April 1936

(7) THE NAVY AND THE DIPLOMATIC FRONTIER. (Prize Essay, 1936) Lieut.Commander Harris

(8) THE SABBATICAL YEAR. Commander Henry

(9) CHEMICAL WARFARE. Commander Flanigan

(10) A FORGOTTEN FIGHT IN FLORIDA. Captain Knox

(11) PUBLIC SPEAKING. Commander Luckel

PIONIERE (Germany)

By Major F. During, Infantry

November 1935

(1) DER ANGRIFF DES III. A.K. ÜBER DIE DONAU BEI SEMENDRIA. [The crossing of the Danube at Semendria by the German III Corps in 1915.] Major Bessell

After Austro-Hungary's first unsuccessful offensive against Serbia in 1914, the Serbian front was reestablished along the Danube and remained there until the Central Powers, in order to open up a safe route communicating with Turkey, decided to eliminate Serbia from the war altogether. The new offensive started in October 1915. It was no longer a purely Austro-Hungarian affair. This time there was a composite group of armies under a German commander-in-chief, Mackensen, and the plan he executed was for the German Eleventh Army and the Austro-Hungarian Third Army concentrated in southern Hungary to invade Serbia due south across the Danube, the former east and the latter west of Belgrade, while the Bulgarian First Army was to invade from Sofia by advancing due west on Nisch.

Major Bessell describes the crossing of the III Corps, the right corps of the German Eleventh Army, which took part on a two-division front at Semendria about 30 miles downstream from Belgrade.

The Danube was 1,000 yards wide, of varying currents, and from 15 to 30 feet deep. Semendria was known to be one of the strongest enemy fronts, but the attacker had the advantage of a large and heavily wooded island. Care was taken to gain this island unharmed, so that the strip of water remaining to be crossed was only a fraction of the total width. Ferrying was ordered to start at 3:45 AM, 9 October, and in the left sector 3 battalions had crossed and formed a bridgehead by 6:30 AM. In the right sector, however, there was delay and trouble. Fifty-three pontons with nearly 1,000 infantry on board, being an hour late, were caught by daylight afloat, and came under heavy infantry and artillery fire. Landing bridges were started on both banks immediately. By 16 October the German Eleventh Army was across the Danube, but still without a bridge behind it. On 17 October a floating bridge arrived and by 20 October this bridge was completed.

Once the armies were over the Danube, and in the case of the Third Army over the Save as well, the conquest of Serbia, carried out brilliantly from start to finish, was over in one and one-half months. How two armies were able to successfully cross a difficult river against opposition in less than one month from the date the operation was decided upon, was due to the fact that a representative of the German General Headquarters had been occupied in South Hungary since April 1915 in studying the problem from every angle, and in months of thorough reconnaissance had worked out a plan for crossing in such detail that it needed hardly more than the troops to arrive for its immediate execution.

(2) VERWENDUNG UND AUSBILDUNG DER MOTORISIERTEN PIONIERKOMPANIE. [Employment and training of a motorized engineer company.] Captain Meltzer

The author cites two examples from the late war, where motorized engineers would have been successful. When in August the bulk of the German Eighth Army advanced against the Russian First Army at Gumbinnen, it had only one Corps to protect its right flank against the advancing Russian Second Army. As this corps was unable to hold up the Russians, the Germans had to break off the battle of Gumbinnen. If motorized engineers had been available to place obstacles south of Allenstein, on terrain which was specially suitable for such an operation, the fateful order for the German retirement behind the Vistula would not have been necessary. Similarly, the gap between the German First and Second Armies at the battle of the Marne could have been closed quicker and more effectively if motorized engineers had been available for blocking the enemy's advance. The battle of the Ourcq could then have been carried to a victorious end. After these two impressive examples of how motorized engineers would have altered the course of events, Captain Meltzer assures

us that the warfare of the future will probably produce similar situations and opportunities more often than hitherto. He then investigates the enlarged sphere of employment of the engineers owing to their being carried in mechanical transport, and shows that it will lead to a greater degree of independence, and to the necessity of providing for their own defence against aircraft. The basis of his demands is that the motorization of field companies is not merely a new and more pleasant means of progression, but something which opens up fresh fields and possibilities.

QUARTERMASTER REVIEW

March-April 1936

(1) ENGLAND—EMPIRE BUILDER. Redmond
(2) BLOOD WILL TELL. Lieut.Colonel Johnson
(3) FIRST ARMY MANEUVERS. Major Douglas
(4) NEW MOBILE DISTRIBUTION PLANT. Captain Brown
(5) FATHER DAMIEN—MOLOKAI MARTYR. Major Holt
(6) THE ARMY IN FLOOD TIME
(7) STRATEGIC RAW MATERIALS. Colonel Wagner
(8) GUIDE FOR SALES OFFICERS, U.S. ARMY. Major Porter, and Wilson

REVISTA DEL EJERCITO Y DE LA MARINA (Mexico)

By Captain Wendell G. Johnson, Infantry

October 1935

(1) NUESTROS MILITARES EXPONEN SU SABER. [Our officers show their knowledge.] Captain Perez Flores

A resumé of the lectures on military subjects given before the National Association of Sciences and Arts in September 1935.

(2) PROBLEMA DEL PACÍFICO. [The problem of the Pacific.] Prak

A translation of the article on causes that might precipitate war in the Pacific, which was published in the "Annals of the U.S. Naval Institute," July 1935.

(3) DESCRIPCIÓN SIMPLIFICADA DE LA AMETRALLADORA LIGERA, SISTEMA "MADSEN." [Simplified description of the Madsen light machine gun.] Lieutenant Garcia Macias

(4) VETERINARIA. [Veterinary.] (I) Lieut.-Colonel San Martin

History of veterinary practice.

(5) URBANIDAD Y CORTESIA. [Military customs and courtesies.] Major Cravioto

A continuation of extracts from the work of the author, Major Cravioto.

(6) EL ENLACE DE LOS GRUPOS DE LA INFANTERÍA-ARTILLERÍA, EN EL ATAQUE. [The infantry-artillery team in the attack.]

Translation of the study of Captain Robert A. Case, U.S. Infantry.

November 1935

(7) ELEMENTOS MECANIZADOS DE LA DIVISIÓN DE CABALLERÍA. [Mechanized elements of the cavalry division.]

Translation of the study by Major Robert B. Grow, U.S. Cavalry.

(8) HISTORIA DE LA GUERRA AÉREO-MARÍTIMA, EN FLANDES. [History of the air-marine war in the western theater.] (I)

Translation of the study of Pierre Barjou.

(9) ALFREDO THAYER MAHAN. [Alfred Thayer Mahan.] Lieutenant de Nava, Mexican Navy

A biographical sketch of the great American admiral.

(10) VETERINARIA. [Veterinary.] (II) Lieut.Colonel San Martin

A continuation of the history of veterinary practice.

(11) URBANIDAD Y CORTESÍA MILITARES. [Military customs and courtesies.] Major Cravioto

December 1935

(12) ABISINIA Y SU CONFLICTO ITALO-ETIOPE. [Abyssinia and her Italo-Ethiopian conflict.] Major Caballe

A translation from the Spanish "Memorial de Infanterie del Ejercito Espanol."

(13) LA GUERRA AEREO-MARÍTIMA EN FLANDES EN 1917.—LA LUCHA POR LA SUPREMACIA DEL AIRE EN LOS BANCOS DE FLANDES. [History of the air-marine war in the western theater in 1917. The struggle for supremacy in the air on the Flanders coast.]

Continuation of the translation of the study by Pierre Barjou.

(14) LAS EXPERIENCIAS DE LA GUERRA EN EL EMPLEO DE LA CABALLERÍA MODERNA. [The trials of war in the employment of modern cavalry.]

Translation of a study by Captain G.B. Guenther, U.S. Cavalry.

(15) LA CABALLERÍA MODERNA EN LAS ACCIONES MONTADA Y DESMONTADA COMBINADAS. [Modern cavalry in mounted and dismounted actions.]

Translation of a study by Major R.B. Trimble, U.S. Cavalry.

(16) LOS CANONES DE INFANTERÍA. [Infantry cannons.] Major Carvallo

Types, characteristics, and missions of infantry cannons.

(17) EL PROBLEMA DE LA CORROSIÓN. LOS INOXIDABLES. [The corrosion problem.]

(18) URBANIDAD Y CORTESÍA MILITARES. [Military customs and courtesies.] Major Cravioto

REVUE DE L'ARMEE DE L'AIR (France)

By Lieutenant Colonel C.H. Wash, Air Corps

October 1935

(1) AVIATION ET UNITÉS MOTORISÉES. [Aviation and motorized units.] Captain Etienne

A survey of the problems imposed upon aviation by the rapidly growing employment of motorized units. The author includes troop movements by truck, motorized supply trains, and operations of mechanized units and tanks, in his survey.

Aviation will be called upon for liaison with these units on both offensive and defensive missions. It will be expected to perform reconnaissance for them and to combat them.

The author outlines a complete category of new duties and responsibility for aviation operating in conjunction with ground forces.

(2) LIMITES D'UTILISATION DES AVIONS DE CHASSE MODERNES. [Operating limits for modern pursuit aircraft.]

The material in this article has been very thoroughly covered by research in our services.

(3) DOCUMENTS DE LA GUERRE 1914-1918. L'INCENDIE DE LA GARE D'HAÏDAR PACHA. [Documents of the War, 1914-1918. Destruction of depot at Haidar Pacha.]

An interesting article on the fortuitous destruction of the great Turkish-German depot at Haidar Pacha, by fire, on 6 December 1917.

November 1935

(4) POUR UNE POLITIQUE INDUSTRIELLE DE L'AÉRONAUTIQUE. [For an industrial policy in aviation.] Captain de l'Escaille

The former chief of the French Naval Aviation approves of a "planned economy" in regard to the aviation industry of France in preference to subjecting it to the natural laws of industrial competition.

(5) NAISSANCE ET PERSPECTIVES DE DÉVELOPPEMENT DE L'AVIATION MILITAIRE ALLEMANDE. [The birth and the prospective development of German military aviation.] Bouché

A profusely illustrated article on the present state of the German air forces. The author is not impressed by the rumors of the mighty air force, supposedly secretly constructed by the Germans. He estimates that early in the fall of 1935 their first line combat aircraft totalled 250. He passes all their types in rapid review and concludes that none of them are particularly formidable. The article covers the organization, methods of training, and the equipment of both civil and military aviation. Con-

siderable space is given to recent German technical effort, particularly in engine development. This article is an authoritative summary of the status and prospects of German military aviation.

(6) RÉSERVE GÉNÉRALE ET DIVISION AÉRIENNE. [The General Reserve and the Air Division.] Captain Etienne (Res.)

This article is a discussion of the relative merits of the generally accepted methods of employing aviation units. It refers particularly to the formation and the experience of the first French "Division Aérienne" in 1918. It is followed by a letter from General Duval, who organized and commanded the "Division Aérienne."

It is an argument in favor of an independent air force, no matter what its name, Air Division, General Headquarters Air Force, or Air Army.

(7) LES VIRAGES DES HYDRAVIONS DE GRANDE VITESSE. [Turns by high speed hydroplanes.] Cushing

A study of the methods of making high speed turns in racing aircraft.

December 1935

(8) CONTRIBUTION À L'ÉTUDE DE LA GUERRE AÉRIENNE AUTONOME. [A contribution to the study of autonomous aerial warfare.] Captain Etienne

The author is concerned with the logistics of independent air forces. He outlines all of the difficulties of supply and communications which will face an air force operating independently of ground forces.

The latter half of his article treats of the difficulties of "security" in air force operations.

(9) HISTOIRE DE LA GUERRE AÉRONAVALE DANS LES FLANDRES. [History of the aero-maritime warfare off Flanders in 1918.] Lieutenant Barjot, French Navy

Another historical article on the allied struggle against German submarine warfare in 1918.

(10) NOTE-ANNEXE SUR L'EFFORT DE L'EFFORT DE L'ÉTAT, DE 1928 À 1933, POUR LA CRÉATION D'AVIONS ET D'HYDRAVIONS PROTOTYPES. [Note on the Government participation in the development of experimental aircraft from 1928 to 1933.]

This article deals with the difficulties which the French government and the French aircraft industry have encountered in attempting to find a method of determining a fair price both for experimental aircraft and aircraft produced in quantity. Their difficulties are essentially the same as those which remain unsolved in this country.

REVUE D'ARTILLERIE (France)

By Captain F.J. Tate, Field Artillery

October 1935

(1) OBUSIERS MODERNES POUR DIVISIONS ET CORPS D'ARMÉE. [Modern howitzers for employment with the division and corps.] General Challéat

The author discusses the salient features in the development of howitzers in the French Army from Gribeauval's period until the present day. The article includes such discussions as the artillery under Gribeauval, Napoleon, Bange, Baquet, and others; the development of the rifle bore weapons since 1858; experiments in the use of light howitzers to answer the purpose of the German 105-mm.; experiments in the use of the reduced charged 75-mm. projectile, the artillery situation in 1910, status of light howitzers in 1913, and the present-day concept of the employment of howitzers in the French Army.

(2) TABLES DE TIR NOMOGRAPHIQUES. [Simplified graphic firing tables.] Captain Vergeron

(3) DU GROUPEMENT À LA BATTERIE DANS LA BATAILLE DE 1914. [The employment of the battery as part of a groupment in the battles of 1914.] Lieut.-Colonel de Mazenod

(4) LA NOUVELLE INSTRUCTION SUR LE TIR DE L'ARTILLERIE ALLEMANDE. [Present-day teachings in artillery fire in the German artillery.] (I)

Review of recent German publications (technical) on artillery fire.

November 1935

(5) PRÉPARATION BALISTIQUE ET AÉROLOGIQUE DES TIRS. [Preparation of fire to correct ballistic and atmospheric conditions.] General Delègue

(6) LE TIR CONTRE LES ENGINS MÉCANIQUES. [Fires against mechanized vehicles.] Lieut.-Colonel Nôtre

(7) LA MÉTHODE DU CHANGEMENT D'ORIGINE DE COORDONNÉES POLAIRES APPLIQUÉE À LA RÉSOLUTION DES PROBLÈMES DU TIR DE GROUPE. [Method of changing the origin of Polar coordinates (of the observation post into those of the piece) as applied to problems requiring battalion concentrations.] (I) Major Grèze and Captain Viet

(8) UNE SECTION DE MONTAGNE AU REICHACKERKOPF.—AFFAIRES DE METZERAL. [A section of a mountain battery at Reichackerkopf in the engagements at Metzeral.] Captain Peyrard

(9) LA NOUVELLE INSTRUCTION SUR LE TIR DE L'ARTILLERIE ALLEMANDE. [Present-day teachings in artillery fire in the German artillery.] (II)

A continuation of an article which appeared in previous issue of "Revue d'Artillerie."

December 1935

(10) LA NOUVELLE INSTRUCTION SUR LE TIR DE L'ARTILLERIE ALLEMANDE. [Present-day teachings in artillery fire in the German artillery.] (III)

Concluding article of review of German publications (technical) on artillery fire.

(11) SUR LES VITESSES ANGULAIRES (EN AZIMUT ET SITE) D'UN OBJECTIF AÉRIEN. [Angular speed (azimuth and site) of aerial targets.] Lieutenant Boos

(12) LA MÉTHODE DU CHANGEMENT D'ORIGINE DE COORDONNÉES POLAIRES APPLIQUÉE À LA RÉSOLUTION DES PROBLÈMES DU TIR DE GROUPE. [Method of changing the origin of Polar coordinates (of the observation post into those of the piece) as applied to problems requiring battalion concentrations.] (II) Major Grèze and Captain Viet

(13) QUELQUES ANCÊTRES DU MATÉRIEL DE PROTECTION "Z." [Some of the forerunners of protective material "Z" (respiratory protection against chemicals).] Lieut.-Colonel Grenouillet

REVUE DE CAVALERIE (France)

By Major F. During, Infantry

November-December 1935

(1) LE RÔLE DE LA CAVALERIE ET DE SES CHARS À LA BATAILLE D'AMIENS. [The action of the cavalry and its tanks in the battle of Amiens from 8 to 12 August 1918.] (II) Captain de Labouchere

In this final installment the author describes the action of the machine guns in the direction of Framerville and Proyart. He considers the action up to the evening of 8 August as a great success. On 9 August the 1st Cavalry Division failed to advance north of Vrely until it was joined by the Canadian 2d Division; the 2d Cavalry Division reached the western edge of Maucourt before night. While the advance was satisfactory, the tanks attached to the 3d Brigade were kept in rear too long and therefore did not obtain the best results. The advance was continued on 10 August. The two cavalry divisions were kept in reserve at first, but later were ordered to advance. When the attack reached the battlefield of the Somme, which was cut up by old trenches, shell holes and full of barbed wire, the advance was too difficult for horses and tanks and the cavalry divisions were ordered to the valley of the river Luce. On 11 August the German resistance stiffened and the role of the cavalry was at an end; therefore the entire cavalry corps was held at the rivers Luce and Aure.

During the first two days the terrain, being on the level plateau of Sauterre, offered little cover, but was good for traversing. Cavalry and tanks were able to make excellent headway here. But the author states that according to General Fuller, the combination of horse and tank was not a success. In the advance the cavalry was ahead of the tanks, while

in action the reverse was true. Nevertheless, the battle ended successfully, since the Germans had been compelled to move 36 divisions for this attack in order to stop it.

The author suggests that there is need for a large homogeneous tank unit, which should be supported by reconnoitering units, viz., motorized machine guns, which in turn should be supported by a small number of troops equipped with automatic arms and powerful antitank weapons. These supports should be employed to occupy conquered terrain and would also constitute pivots of maneuver. They should be transported in cross-country motor vehicles. Captain de Labouchere believes the employment of these forces to be: (a) the neutralization throughout its depth of the tactical framework of the enemy, its artillery and reserves; (b) to follow this with normal combatant troops as an advance in depth, but not as a raid up to an indefinite distance.

(2) UN PASSAGE DE RIVIÈRE SUR SACS HABERT PAR LES A. M. C. DU 3E GROUPE D'AUTOS-MITRAILLEUSES. [The crossing of the Eure River by the 3d group motorized machine guns, using Habert sacks.] Major Breuillac

(3) UN COMBAT DE CAVALERIE: GORODOK (17 AOÛT 1914). [Cavalry action at Gorodok, 17 August 1914.] General Inostransev

This is a description of a fight between the Russian 2d Cavalry Division and the Austrian 5th Cavalry Division. The Russians had the mission of holding the line of the Sbroutch River, which formed the frontier between Hungary and Russia. On 16 and 17 August the Austrians attempted to cross this river, but met with strong resistance. On several occasions, combat took place in which lance and saber were used. Finally the Austrians tried to take the village Gorodok by a mounted attack, which failed as Gorodok was held by a battalion of the 14th Chasseurs and two rifle companies.

REVUE D'INFANTERIE (France)

By Captain Wendell G. Johnson, Infantry

October 1935

(1) LA PRISE DE TANANARIVE: 30 SEPTEMBRE 1895. [The capture of Tananarive, 30 September 1895.] General Zaigue

A short account of the operations of the French expeditionary force of 15,000 men sent to Madagascar under General Duchesne in 1895.

(2) LA JOURNÉE DU 22 AOÛT 1914 À LA 5E ARMÉE: CHARLEROI. [Operations of the Fifth Army on 22 August 1914: Charleroi.] (I) Gay

This article describes the Fifth Army's activities on 22 August 1914. It deals with the action of each corps, carrying the story down to the participation of regiments and battalions. The author has used the memoirs and diaries of dozens of participants as sources for his account of the battle. He opens with a description of the general situation on the Sambre and on the Meuse in the early morning of 22 August. This is followed by the movements of the opposing armies and the plan of von Bulow. From this introduction Professor Gay carries the action successively into the sectors of the French III, X, I Cavalry Corps and XVIII Army Corps. Within each he gives a brisk account of the part played by subordinate regiments and battalions, even mentioning certain companies. This study by Professor Gay appears to be a valuable addition to the histories covering the early operations of the War. Unquestionably it is more accurate and more complete than many earlier accounts.

(3) EQUIPAGES MODERNES DE L'INFANTERIE. [Modern infantry equipment.] Lieutenant Colonel Favatier

The author discusses infantry company, combat, and field trains, particularly the cross-country means required in forward areas. The author voices his high opinion of the chenillette (tankette, or ultra light tank) as the desirable, all-purpose vehicle for use within the area under hostile artillery fire and small-arms fire.

(4) UN COMBAT DE CHARS, LE 18 JUILLET 1918, AVEC LA 1RE DIVISION AMÉRICAINE. [A tank engagement in support of the American 1st Division, 18 July 1918.] Major Balland

These tanks had the mission of attacking the hostile artillery. After relating the preliminaries, initial phase and development of the tank action in support of the American 1st Division, Major Balland tells of the individual action of various tank groups and individual tanks. He points out the terrific losses sustained by the St. Chamond and Schneider tanks engaged, both in matériel and personnel, as a result of enemy artillery fire (direct laying). He stresses the need for an appropriate supporting weapon for tanks, as the attention of the tanks should be given to targets dangerous to infantry rather than antitank guns. He insists that a heavy caliber machine gun, mounted on a fast track-laying vehicle with light armor, is the necessary means for providing protection. It must afford good observation, augmented by magnifying means of vision, a wide range of horizontal traverse, preferably of from 20-mm. to 37-mm. caliber. Artillery, aircraft, smoke shells, and infantry protection have failed in the past. Tanks cannot provide their own neutralizing fire and support infantry at the same time. A close supporting, mobile weapon is imperative.

(5) LES CHARS À L'ATTAQUE D'UN DISPOSITIF D'ARTILLERIE. [Tanks attacking an artillery position.] Lieut.-Colonel Perré

Colonel Perré points out errors in the tank operations of 18 July 1918, in support of the American 1st Division (see above). The lack of caution in crossing crests and in foolhardy assaults on hostile artillery are especially mentioned. Tank attacks on artillery are becoming more and more a part of the trend in tank tactics development in many armies. How it may be accomplished is partly indicated by Major Balland in the preceding article.

(6) LE RAVITAILLEMENT EN MUNITIONS DE L'INFANTERIE. [Supply of infantry ammunition.] Lieut.-Colonel Tarrade

A digest of the study of Brevet Major Secundino Serrano in "Memorial de l'Infanterie Espagnole," April 1935. Discussion is accompanied by tables showing battalion combat train characteristics and ammunition quantities and types carried within the infantry regiment.

(7) LES BOIS DANS LA DÉFENSIVE. [Woods in the defensive.] (See abstract, page 75)

November 1935

(8) THÈMES TACTIQUES ALLEMANDS POUR OFFICIERS CANDIDATS À L'ETAT-MAJOR. [German tactical problems for candidates to the general staff.] (I) Colonel Koeltz

A series of four tactical situations facing an infantry regimental commander, with requirements for him to solve, and solutions to each, including the complete verbal orders which he gives to his subordinates, staff, and messengers.

(9) LA JOURNÉE DU 22 AOÛT 1914 À LA 5E ARMÉE: CHARLEROI. [Operations of the Fifth Army on 22 August 1914: Charleroi.] (II) Gay

Events, messages, and orders within the I Corps, Cavalry Corps, and XVIII Corps and the general situation in the Fifth Army on 22 August 1914.

(10) INSTRUCTION DES CADRES DE L'INFANTERIE: ÉTUDE DE CAS CONCRETS. [Instruction of infantry officers by the study of a concrete case.] Lieut.Colonel Guigues

A detailed study of the defensive organization of a reserve position by an infantry battalion. The preparations required of the instructor are discussed, followed by the class-room procedure, the terrain exercise, and the execution of the exercise with troops.

(11) LE PROBLÈME DE LA DIRECTION DES VÉHICULES BLINDÉS OU L'ORIENTATION. [The problem of maintaining direction in tanks or their orientation.] Captain Lavirotte

The author explains the different reactions on a magnetic compass employed in a tank and how these vary from those common to usage in airplanes. Further, how the several deviations are compensated. The study continues with a brief description of a gyroscopic course indicator and closes with the author's conception of the combined use of both instruments in the tank—the compass for calculating the line of march when changes of direction are to be made, the course indicator for keeping the tank on a certain azimuth.

(12) LE PELOTON DE CAVALIERS RÉGIMENTAIRE. [The regimental mounted platoon.]

Based on the experience of the Polish—Bolshevik War of 1920, the Polish Army has frankly directed its instruction along the lines of the war of movement. The infantry regiment has been given two mobile elements capable of facilitating offensive maneuver: (a) a regimental mounted platoon of six squads of six men each, two of which are each armed with a light machine gun; (b) a cyclist platoon with two light machine guns. In the May 1935 issue of the Polish Infantry Journal, Lieutenant Colonel Praglowski concludes that the employment of the mounted platoon must be limited to missions of security and contact, maintenance of tactical liaison, and courier work.

(13) LE SOUS-OFFICIER DANS L'ARMÉE SOVIÉTIQUE. [The noncommissioned officers in the Soviet Army.]

Although the Bolshevik revolution of 1917 wiped out the titles of the old Tsarist Army, the general principles of the hierarchy and of the subordination applied in all military organizations have been firmly retained in the Red Army.

There are two distinct categories: the officers and the men. The officers are divided into four groups: (a) lower grades or noncommissioned officers; (b) company officers; (c) field officers; and (d) general officers.

Within each group, similar, if not identical, titles are used as in former times.

Obligatory military service in the U.S.S.R. is theoretically five years. Actually it varies; in the regular units it is for two years with a long furlough following; in the territorials, three months the first year, and a few weeks during each of the succeeding four years. Likely candidates among the recruits go to the regimental platoon of noncommissioned officers and after satisfactorily passing the ten-months course of instruction, are confirmed as noncommissioned officers. During the second year they act as leaders of half groups or groups (squad or section).

In territorial units, the student noncommissioned officers are chosen during preparatory military training (compulsory for two years, 19 to 21). They are incorporated into the permanent establishment of the territorial army and continue the same as regular army personnel.

Upon completing two years' service, noncommissioned officers may reenlist for another year, and again each succeeding year up to 50 years of age. The instruction of these subordinates devolves upon the company commander, but is carried out by units under the general supervision of the battalion commander. Moreover, every year a several weeks' course for the training of noncommissioned officers is carried out within the regiment or division, specializing in the use of weapons, firing, and methods of instruction.

Promotion from one grade to another is secured through further courses of instruction and recommendations based on work performed and capabilities demonstrated.

Advancement from noncommissioned grade to junior officer is possible through attendance at the required school and satisfactory examination—even without this schooling in exceptional cases. Few, however, are capable of this promotion. On the other hand, any noncommissioned officer may be appointed a reserve officer after he has completed three years' service in a noncommissioned grade.

The discharge of noncommissioned officers serving beyond their compulsory limit may be effected through the prerogatives of the regimental commander. It can legally occur (a) upon the expiration of an enlistment; (b) at 50 years of age; (c) in case of physical disability; (d) in case of no vacancy or incompetence.

The latter enables the commanding officer to prevent the reinlistment of unsuitable or undesirable men.

Discharged noncommissioned officers with over 20 years' service are entitled to a retirement pension. They have the right of priority in the allocation of civil positions of the administrative department.

December 1935

(14) CARNET D'UN COMBATTANT: UN COMBAT DE 1914—BARCY. [Notebook of a combatant: a battle of 1914—Barcy.] Lieutenant E.R. (Paul Tuffrau)

A sanguinary account of the incidents that befell a French infantry captain and his company on 6 September 1914.

(15) LA GUERRE DES CHARS. [Mechanized war.] Lieut.-Colonel Perré

A digest and commentary by Lieutenant Colonel J. Perré (instructor at French Tank School) of the work of General Ludwig Ritter von Eimannsberger, entitled "Der Kampfwagenkrieg." Colonel Perré gives a resumé of each chapter of this excellent study of World War lessons with respect to tanks, tank evolution, antitank defense, and the next (mechanized) war. He concludes the digest of each chapter with a discussion thereon. The chapter covering offensive operations of tanks is illustrated by a future battle of Amiens fought with tanks. This the reviewer has depicted in considerable detail.

(16) TIRS DES MITRAILLEUSES À GRANDES DISTANCES: CORRECTIONS APPROCHÉES. [Long range machine-gun fire—approximate corrections.] Captain Franceschi

A study of the effect of atmospheric conditions on long range machine-gun fire and the corrections to be made in laying guns under various conditions of wind, temperature, and pressure.

(17) THÈMES TACTIQUES ALLEMANDS POUR OFFICIERS CANDIDATS À L'ETAT-MAJOR. [German tactical problem for applicants to the general staff.] (II) Colonel Koeltz

A continuation of the series of tactical problems which were presented by Colonel Koeltz in the preceding issue of the "Revue d'Infanterie."

(18) LE SALON DE L'AUTOMOBILE EN 1935. [The 1935 Automobile Show.] Captain Le Gouest

The author comments on the government decree prohibiting trucks with cargo in excess of 15 tons effective 1 January 1939. How, he asks, will it be possible in war time to obtain tank carriers if the automobile industry is equipped only to build lighter vehicles than required to transport tanks. Amendments to the decree or peace-time acquisition are the alternatives.

(19) L'INFANTERIE ET LA GUERRE AÉRO-CHIMIQUE. [Infantry and air-chemical attack.]

A digest of the article by Colonel Mario Pecchio in the Italian Infantry Journal of June 1935.

Well trained infantry must not let itself be turned from its mission by an air gas attack. Such is the thesis maintained by the author. He comments on the difficulties of delivering an effective gas attack by airplanes, how infantry can counter such measures, and the training to be given toward preparing infantry to meet gas attacks. To this, Lieutenant Colonel Lorrade, the reviewer, adds several interesting points.

REVUE DU GENIE MILITAIRE (France)

By Lieutenant Colonel P.C. Bullard, Corps of Engineers

September-October 1935

(1) LE TRANSSAHARIEN. [The proposed Trans-Sahara railroad.] Captain Simon

A number of studies and plans have been made in the past for a railroad across the Sahara from Algeria, in northern Africa, to the region of the Niger River. In 1928 the French government authorized an official study of the plan. The three principal requirements of the railroad should be that it be easy of construction, serve economic purposes, and connect with the railroad net of northern Africa. Various routes were studied and reconnoitered. The construction, operation, and upkeep of the railroad across the actual desert present special problems. Water is, of course, scarce or lacking. The movement of sand and the construction across sand must be considered. Would the railroad be truly useful? Could it be sufficiently protected against damage from native bands in case of

uprising? To what ports should connection be made at the southern end? Is a railroad desirable in view of the present possibilities of motor transportation?

These studies resulted in conclusions in favor of a project of construction of the railroad from Oran (with a connection to Algiers) southward across the desert to In Tassit (near the northernmost bend of the Niger River), with branches extended to the southwest to Segou and southeast to Dosso, at which points connections are made with railroads already constructed or in project.

Economically, the railroad is expected to afford an adequate return in relatively short time, with excellent prospects still further into the future. The cost would be three billion francs.

It is reported that the Trans-Sahara railroad is no longer a real risk; it would be easy and relatively cheap of construction, and this type of transportation is preferable to any other means practicable in the Sahara. France "would have the equivalent of a French sea" (for transportation purposes) between Algeria and the Sudan. It is considered a work of national importance.

(2) ETUDE SUR LES TÉLÉFÉRIQUES. [The design of overhead cableways for the supply of troops in mountains.] (I) Captain Leygue

(3) ENQUÊTE SUR LA RADIESTHÉSIE. RÉSPONSES DE GÉOLOGUES, D'INGÉNIEURS DES MINES, ETC. [Inquiry into radiesthesia. Reply of geologists, mining engineers, etc.]

The magazine has independently called upon the experience of a number of scientists, all of whom agree that the operations of the well-finders is unreliable and unscientific, and a number consider them as simply charlatans.

(4) EXERCISE SUR LA CARTE (SAPEURS-MINEURS). PASSAGE DE LA SEINE À ABLON. [Map problem: Engineers. Forcing a passage of the Seine at Ablon.] (I)

Situation and requirements.

November-December 1935

(5) ETUDE SUR LES TÉLÉFÉRIQUES. [The design of overhead cableways for the supply of troops in mountains.] (II) Captain Leygue

(6) ENQUÊTE SUR LA RADIESTHÉSIE. ESSAI DE CONCLUSION. [Inquiry into radiesthesia. Concluding essay.] Lieut.Colonel Metz

It is concluded that the art of the well-finder is unreliable, but that there are certain physiological and physical phenomena connected with it that are worth further investigation in order to determine their causes.

(7) EXERCISE SUR LA CARTE (SAPEURS-MINEURS). PASSAGE DE LA SEINE À ABLON. UNE SOLUTION. [Map problem: Engineers. Forcing a passage of the Seine at Ablon.] (II)

A solution.

REVUE MILITAIRE FRANCAISE (France)

By Major C.R. Moore, Corps of Engineers

October 1935

(1) GUERRE D'HIER ET DE DEMAIN, DÉFENSIVE ET MOTORISATION. [War, yesterday and tomorrow: The defense against motorized units.] General Pichon

The theme of General Pichon's discussion is that although we may assume with General Eimannsberger that mass attacks of mechanized forces (10,000 to 20,000 tanks) will not develop for some months after war is declared, attacks with smaller mechanized and motorized forces must be expected in the earliest days of war, and preparations must be made to resist such attacks. He gives five illustrative situations on various types of terrain with solutions.

All-around distant security with suitable communications to give instant notice to the main body is essential to prevent surprise and permit it to make the necessary dispositions for the defense. The defense will rely chiefly on the use of the natural defensive strength of the terrain and the use of antitank weapons, of which each battalion will require three.

(2) QUELQUES RÉFLEXIONS SUR L'ÉVOLUTION DE LA TACTIQUE. [Reflections on the evolution of tactics.] Lieutenant-Colonel Lancon

Tactics is subject to the inevitable law of evolution. In tactics as in other sciences, theories become final only when they have been fully tested, and this can be done only in war. Since wars are becoming less and less frequent, and technical and political developments are progressing rapidly, war is either begun with the tactics of the last, or with a new but unproven system.

Some tests of new weapons and methods can be made in times of peace, but conclusions are apt to be erroneous. In maneuvers the defender without ammunition in his machine guns and artillery, presents a pitiable sight, in comparison to the dashing advances of the attacking infantry, mechanized vehicles, and airplanes. From these results theorists with a gifted tongue, by logical arguments based on false premises, can mislead a multitude of followers, as in the case of Colonel de Grandmaison prior to 1914.

At the present time rapid progress is being made in the construction of automobiles, in aviation, in radio, and in chemistry.

The nation which at the beginning of hostilities has fully integrated the use of these technical advances into its system of tactics will possess an enormous advantage. The next war may not last four years, giving the unprepared a chance to remedy his prior deficiencies.

Much can still be learned from the lessons of the World War if the complete facts are obtained and proper choice is made of examples. Early in the War, reliance for success was placed principally on the morale of the infantry soldier; when in spite of its courage the infantry was stopped by machine guns, a complete switch of emphasis was made to the artillery. Before the end of the War it was evident that artillery alone could not completely prepare the way; hence the use of infantry auxiliary weapons and tanks received more attention.

Since the World War developments have consisted in the improvement of armament of the kinds used during the War. If anything radically new exists, it has been kept secret.

Much is being written and proposed for the use of mechanized vehicles and aviation at the present time. Theories which are being advanced for the independent use of these weapons violate the principle of the cooperation of arms. Tanks and airplanes can not perform all missions and be substituted for other arms. They do not diminish the importance of the infantry, artillery, cavalry, or engineers. They form a useful complement to these arms, and working in conjunction with them, increase the effectiveness of the military system as a whole. In military matters perhaps more than anywhere else, "in union there is strength."

(3) INTRODUCTION À UNE ÉTUDE DE L'ORGANISATION MILITAIRE ESPAGNOLE. [Introduction to the study of the Spanish military organization.] Major Morel

A brief description of the Spanish Army, covering the historical and political situation in the introduction.

November 1935

(4) LES SYSTÈMES FORTIFIÉS DANS LA DÉFENSE DE LA FRANCE DEPUIS 300 ANS. [Fortification systems for the defense of France during the past 300 years.] (II) Major Montigny

Part I of this article appeared in the September 1935 issue of "Revue Militaire Francaise."

(5) DE LA SAMBRE À L'OISE. ESSAI DE GÉOGRAPHIE MILITAIRE. [From the Sambre to the Oise. A study in military geography.] Captain Thoumin

A description of this area which was the scene of much combat during the War of 1914-1918.

December 1935

(6) LES SYSTÈMES FORTIFIÉS DANS LA DÉFENSE DE LA FRANCE DEPUIS 300 ANS. [Fortification systems for the defense of France during the past 300 years.] (III) Major Montigny

This is the third and final article in this series. After covering the history of previous systems of fortifications in France, the author points

out the necessity for, and the use of permanent fortifications under present conditions. He states the general principles which should govern their location and construction.

(7) LES COMBATS AUTOUR DE LILLE EN 1914. [Combat around Lille in 1914.] (I) Captain Van Belle

REVUE MILITAIRE SUISSE (Switzerland)

By Major F. During, Infantry

October-November 1935

(1) LES SERVICES DE RENSEIGNEMENTS, DE LIAISON ET DE TRANSMISSIONS DANS LE RÉGIMENT D'INFANTERIE. [Organization of intelligence, liaison, and signal service of an infantry regiment.] (I) Lieutenant Koelliker

The author suggests an organization of the intelligence, liaison, and signal service of an infantry regiment based on Swiss regulations. The duties of the three services are as follows:

(a) The signal troops insure communication between headquarters by technical means or messengers.

(b) The liaison troops insure collaboration of commanders by means of liaison agents.

(c) The intelligence service collects information, studies and distributes it, making use of the signal and liaison troops.

The intelligence service is dealt with at some length in this installment. The author states that three kinds of information are necessary to a commander: (a) concerning the enemy; (b) concerning one's own troops; and (c) concerning the terrain.

December 1935

(2) PROJECTILES ET BOUCHES À FEU. [Projectiles and guns.] General Rouquerol

In this article the author discusses the relative merits of a small caliber gun with a large amount of ammunition, and a large caliber gun with a limited supply of shells. He concludes that there should be distinct types of guns, intended for short and long range fire, respectively.

(3) DÉFENSE ACTIVE—DÉFENSE PASSIVE. [Active and passive defense.] Jacques

The author discusses the active and passive methods of protection of the civil population against airplane attacks. He lays stress on the point that the object of active military defense of a country is the prevention of accomplishing the enemy's bombardment missions and not the destruction of enemy planes in aerial combat.

(4) LES SERVICES DE RENSEIGNEMENTS, DE LIAISON ET DE TRANSMISSIONS DANS LE RÉGIMENT D'INFANTERIE. [Organization of intelligence, liaison, and signal service of an infantry regiment.] (II) Lieutenant Koelliker

In his concluding installment, Lieutenant Koelliker gives a detailed list of the equipment, etc., required by the regimental intelligence service. He also gives some particulars of a course of group and individual instruction.

RIVISTA DI ARTIGLIERIA E GENIO (Italy)

By Major F. During, Infantry

October 1935

(1) UN ESEMPIO DI COOPERAZIONE FANTERIA-ARTIGLIERIA DURANTE LA GRANDE GUERRA. [An historical example of the cooperation between infantry and artillery during the World War.] General Porro

This article is a description of the effective cooperation between the Italian 3d Infantry and the 23d Field Artillery, during the operations at Mount Kuk and the Vodice between May and August 1917.

(2) QUESTIONI DI ARTIGLIERIA NELLA STAMPA ESTERA. [Questions concerning artillery.]

The unknown author records the opinion expressed in "La France Militaire" by Generals Challéat and Culmann regarding the artillery of

the future. The Chaco War has shown the remarkable effect of the 81-mm. Stokes-Brandt mortar, having a range of about 3,000 yards, while artillery guns of smaller caliber than 105-mm. have produced indifferent results. From this fact the conclusion was drawn that when all field artillery has been motorized, there will be no reason for having any caliber between the 47-mm. antitank gun and the 105-mm. gun.

General Challéat disagrees with this conclusion, as the 75-mm. gun proved so efficient during the late war. He suggests the following artillery organization for a division: One regiment of two battalions of 75-mm. guns and one battalion with interchangeable bores (75-mm. and 47-mm.), for artillery for infantry regiments; one regiment of two battalions of 105-mm. guns having curved trajectory and one battalion of 75-mm. guns for combined action and antiaircraft work.

General Culmann, however, does not consider the 75-mm. gun sufficiently powerful, but believes the French artillery should gradually be reequipped with a gun-howitzer for all-around use.

ROYAL AIR FORCE QUARTERLY (Great Britain)

April 1936

(1) BOMBER AIRCRAFT

(2) AIR WARFARE—THE PRINCIPLES OF AIR WARFARE. General Douhet

(3) AIR STRATEGY: DOCTRINES; PROBLEMS OF BRITISH AIR STRATEGY; TECHNICAL PROGRESS. Lieut.-General Golovine

(4) BOMBER FORMATIONS IN THE NEXT WAR—A REPLY

(5) BOMBS VERSUS BATTLESHIPS

ROYAL ENGINEERS JOURNAL (Great Britain)

March 1936

(1) THE MANDI HYDRO-ELECTRIC SCHEME (UHL RIVER). Captain Guthrie

(2) MECHANIZATION: THE PART PLAYED AND TO BE PLAYED BY THE ROYAL ENGINEERS. Colonel Davidson

In this article the author discusses the part played by the Royal Engineers in mechanization, (a) in pre-war days, (b) in post-war days, and (c) during the present time.

(3) THE WANA LADHA ROAD. Colonel Jackson

(4) THE INDIVIDUAL TRAINING OF A.A. SEARCHLIGHT UNITS. Lieut.-Colonel Grove-White

(5) A NEW-MODEL ARMY. Major Fowle

(6) THE WORK OF THE CONTRACTING ENGINEER. Reid

(7) THE BREN LIGHT MACHINE-GUN

SANCT CHRISTOPHORUS (Germany)

By Lieutenant Colonel S.J. Heidner, Infantry

October 1935

(1) UEBER DAS GEFECHT "KAMPFWAGEN GEGEN KAMPFWAGEN." [Concerning the combat of "Tanks versus Tanks."]

This is a review of a Russian article by Alexandrow in "Motorizazja i Mechanisa." The following points are discussed:

In the combat of tanks against tanks, the outcome will depend upon the relative speed, armor, and armament of the opposing tanks. The author, therefore, considers it important to know the characteristics of the enemy's tanks so that they may be opposed by tanks superior in the above respects.

Due to the great mobility of modern armored vehicles, any fight involving them will develop and terminate rapidly. Hence the extreme importance of thorough reconnaissance and a reliable communication system. The author points out that the reconnaissance must be conducted largely by airplanes attached to the tank units. But to make the reconnaissance continuous, the air observation must be supplemented by recon-

naissance of armored cars and other ground agencies. Without complete reconnaissance, tanks might fall into a trap and be suddenly attacked on unfavorable terrain and in a disadvantageous formation. If, however, the tank commander gets timely information about the hostile tanks, he should be able to choose terrain favorable to himself for the encounter, and he should be able to surprise the enemy. The tank commander should look for terrain such that his tanks can emerge from cover to fall upon the hostile tanks by surprise, and without coming under direct fire from the hostile artillery. If possible, the enemy should be attacked at the moment when he is coming out of a defile, for, at that time, his maneuverability will be restricted, and he will be able to bring only a part of his tanks into the fight.

The formation for the attack should be on a wide front and not too deep. A narrow formation, at its best, can give only local results, and the crowding together of the attacking tanks will cause them to have greater losses. A formation in depth permits the forward echelons to be supported by fire from accompanying artillery tanks in the following echelons. Striking the hostile tanks simultaneously from different directions, or striking him with closely following successive attacks from the same direction, should both be very effective. In the second case the successive attacks must follow each other closely in order to have the maximum effect, and in order to avoid having an echelon destroyed before the succeeding one strikes.

The discussion continues with the subject of tanks against tanks. In this case aviation only will be able to support the attacking tanks. There are no historical examples of such an engagement. The author believes that if the tank commander, through careful reconnaissance, determines the hostile dispositions, he will be in a position to order a successful attack. Subordinate commanders must be carefully informed of the intentions of the commander, and must know the terrain over which the attack is to be made. They must carefully organize their units for the attack. Among other things, they should designate certain tanks to remain stationary, and support the attacking tanks with fire. Careful preparation is necessary, particularly because the commander can exercise little control after the attack is launched. About all he can do, after the attack has begun, is to commit the reserve tanks at the proper moment. The author believes that the control of platoons is possible only when they are limited in size to five tanks.

The case is also considered where tanks are attacked by hostile tanks by surprise. In that case success will depend upon the prompt assumption of a fighting formation, skillful use of the terrain, and iron leadership.

When tanks are attacking in conjunction with other troops, the artillery should fire on any hostile tanks as soon as they are discovered or come within range. In order to determine whether the hostile tanks are attacking alone or in conjunction with other troops, the commander must initiate a thorough reconnaissance. If the hostile tanks penetrate the friendly infantry lines, the infantry antitank weapons must go into action. It will be very advantageous to have these weapons cover the advance of the friendly tanks. In case the tanks must pass through their own infantry lines, an interval should be left for them, and the antitank weapons should cease firing as the friendly tanks pass through them, otherwise one weapon will be hindering the other. The defending tanks should await a moment to fall upon the hostile tanks on favorable terrain by surprise.

When opposing tank units unexpectedly encounter each other, all possible weapons must be brought into action. The leading echelons may be supported by fire from the succeeding ones if the formation permits. The leading echelon should not push the direct attack too far in order to permit the following echelons to make an envelopment and capture or destroy the hostile tanks. During such an attack the platoon is the largest unit that can be controlled. The fight will consist of a series of individual encounters. If the enemy is met in column, he must be immobilized from the front and then attacked from the flank.

In conclusion, the author points out that the most varied methods are possible when fighting tanks. Leadership, maneuverability of units,

continual preparedness for action, and proper utilization of the terrain will play the principal roles. Technical and tactical preparations are also of material importance. Application of the many new developments in tank tactics, and instruction in the characteristics of the enemy's tanks with their advantages and disadvantages, should be the fundamental requirements for the training of tank troops.

(2) PANZERABWEHRWAFFEN. [Antitank guns.]

Great Britain.—The firm of Vickers-Armstrong has produced a new 40-mm. antitank gun which is also suitable for antitaircraft work. For antitank use the gun uses a shell with a delayed-action fuse. The shell will penetrate 15-mm. of armor at 1,000 yards.

The British mechanized division artillery is to have attached to each battalion a battery of antitank machine guns for the immediate protection of the field artillery batteries.

Japan.—The Japanese army has adopted a new combination antitank-antiaircraft weapon. It consists of a pair of 13.2-mm. Hotchkiss machine guns on a mobile mount. The bullets penetrate 20-mm. of armor at 500 yards, 15-mm. at 1,000 yards, and 12-mm. at 2,000 yards. Tracer bullets visible for 1,500 yards are provided. A crew of three operates the gun.

France.—The firm of Hotchkiss has produced a 25-mm. antitank gun. It is mounted on a two-wheel rubber-tired carriage with a split trail and with an armored shield for the protection of the gunners. The gun is drawn by a truck. It has an effective range of 3,400 yards. Cartridges are loaded in clips of ten. The gun fires 100 rounds per minute. Tracer bullets visible for 3,500 yards are provided.

Switzerland.—For the anti-mechanized defense of the infantry, the Swiss have adopted a 37-mm. gun. This weapon is taken apart for transport. It has a light shield for the protection of the gunners.

(3) MOTORISIERUNG DER WAFFEN. [Motorization of weapons.]

Spain.—The extent to which the idea of motorization has taken root, is shown by the fact that Spain is going to motorize an infantry division.

Russia.—The article reviews the effort the Russians are making to manufacture tractors. The Stalingrad tractor works, according to the Russians, produced 40,200 tractors in 1934. Factories at Charkow, Tscheliabinsk, Moscow, and Gorki are producing similar quantities. The author does not think that the Russian machines have reached a high degree of mechanical perfection.

Great Britain.—British reconnaissance units have been equipped with an eight-wheel Armstrong-Sidley truck which has a speed of about 28 miles per hour and is capable of crossing very rough ground. It has a carrying capacity of two tons.

The chassis of the familiar Mark II medium tank is being used for the transportation of riflemen. These vehicles will transport 12 men and a quantity of ammunition. They have a maximum speed of 35 miles per hour.

The firm of Vickers-Armstrong is producing in quantity a truck that runs on four caterpillar treads. It has a speed of 12 miles per hour, carries a load of 6.6 tons, and has remarkable cross-country ability.

November 1935

(4) KRITISCHE BETRACHTUNGEN ZUR "ABWEHR VON KAMPFWAGEN." [Critical observations on antitank defense.] (See abstract, page 48)

(5) IMMER WIEDER NEUES VON DER HEERESMOTORISIERUNG IN FREMDEN HEEREN. [More news about motorization.]

In recent maneuvers, near the Bulgarian frontier, the Turks employed several battalions of medium tanks armed with 75-mm. guns. There has also been observed in their army a six-wheeled armored car with its guns mounted in a revolving turret. Some of the Turkish tanks were manufactured in Russia.

Realizing the importance of accurate firing from armored fighting vehicles, the Russians are making a special effort to train the crews of these vehicles in marksmanship. The first training is given on a sub-caliber range equipped with guns mounted in fixed turrets. Competitions are used to keep up interest.

The Russians have been experimenting successfully with the use of two steel beams for moving Christie tanks over trenches. These beams can be easily carried by the tank itself, and can be placed in position quickly by a few men.

Great Britain has introduced a rolling field kitchen for motorized units. It is to be drawn by a truck or tractor. There is room enough for two cooks to work in the kitchen while it is in motion.

Sweden is motorizing a cavalry brigade, an infantry brigade, and other units.

In Great Britain there has been manufactured a new Universal-Vickers 50-caliber machine gun for antiaircraft and antitank defense. It has a two-wheeled mount, and is towed by a truck or tractor. The British have also developed a new infantry cannon with two barrels, one of 25-mm. and the other of 70-mm. The larger barrel is to be used against hostile infantry, while the smaller is for antitank defense.

France has a new 25-mm. Hotchkiss antitank gun. It shoots 100 rounds a minute, the shells being loaded in clips of ten. The gun is mounted on rubber-tired wheels, and will be towed by a tractor.

December 1935

(6) DER KOMMANDIERENDE GENERAL DER PANZERTRUPPEN OSWALD LUTZ ZUM "GENERAL DER PANZERTRUPPEN" BEFÖRDERT. [The Commanding General of the Armored Forces, Oswald Lutz, promoted to "General of the Armored Forces."]

In the German army there has been created the new grade of "General of the Armored Forces." The former commanding general of the armored forces, Oswald Lutz, an officer of 40 years' service, has been elevated to this post.

(7) ERINNERUNGEN EINES EHEMALIGEN KAMPFWAGENMANNES. [Recollections of a former tank man.] Major Bornschlegel

This article, by Major Bornschlegel, who in March 1918, was named commander of the German assault tank units, gives a brief review of the history of the German tanks in the World War. When Major Bornschlegel took over the command of the German tanks, these consisted of five units: three were equipped, each with five German A7V tanks; and two of the units were equipped, each with five captured British tanks. By August 1918, four more units of captured British tanks were organized. Between 21 March 1918, when they were used for the first time at St. Quentin, and the Armistice, German tank units took part in 13 different actions. The tank units did particularly well at Villers-Bretonneux, on 24 April 1918, at Soissons on 27 May 1918, and near Reims on 31 May and 1 June 1918. A new tank organization had been planned for 1919, in which there would be a considerable increase in the number of heavy tanks, and a very large number of light tanks. A satisfactory light tank had been developed when the Armistice put an end to all activities.

(8) BESONDERHEITEN IN DER FÜHRUNG VON KRAFTFAHRKAMPFVERBÄNDEN. [Characteristics of the command of mechanized units.]

The author divides mechanized forces into two categories: first, those armored motor vehicles capable of direct shock action on the battlefield; and second, infantry mounted on cross-country vehicles, and motorized artillery and other auxiliary units capable of moving cross country. The speed and mobility of both of these types of mechanized units demand new principles in their leadership. Careful calculation of time and space factors, and a quick functioning communications system will be particularly necessary.

The author believes that direct personal leadership of mechanized shock units, similar to that of the charging cavalry of former days, will again be possible. He gives this interesting picture of a mechanized attack:

"As the attack rolls forward, we will see that the initiative of the subordinate commanders, moving at the head of their armored units, will have the same influence that it had in the glorious days of our history. They will lead the attack. They will share danger and suffering with their attacking vehicles. They will animate their troops by their own example. There will be no giving of orders from a sheltered dugout where

a commander frets and worries about how the battle is progressing; instead, there will be 'saddle orders' given while in motion, and the contagious example of a charge forward which will show the troops the way to battle and victory. From the vehicle of the leader there will once more fly an ensign of battle. About him the troops will rally for the attack. He will lead his troops to victory or to an honorable end. The armored vehicle gives the possibility once more, in spite of the destructive effect of modern automatic weapons, of giving a personal note to the leadership in battle. The days of the brilliant cavalry leaders are returning. The difference is only that where formerly one man controlled one horse power, he now controls a hundred, and that the shock will therefore be correspondingly greater . . . Quick decisions and lightning execution, flexibility in the attack, utilization of every fold in the terrain, and correct use of the fire-power of his vehicles—all these will be required of the leader. Expert driving, no hesitating when the leader moves out, and the marksmanship of the best wild game hunter—these are necessary attributes of the modern assault cavalry."

(9) VERHALTEN VON KAMPFWAGEN GEGENÜBER ABWEHRWAFFEN. [The action of tanks when confronted with antitank weapons.]

The author discusses the course that a tank should be trained to take when it is moving against a position protected by antitank weapons. Formerly tank drivers were drilled in driving a zigzag course. When tanks moved slowly, and when field pieces, which could not be laid rapidly, were used as antitank guns, such a proceeding was proper. However, the writer believes that zigzag driving is no longer desirable for the following reasons: tanks will attack in large formations, and there would be endless interference between the tanks if they zigzagged; the speed of the tanks would be reduced by such a course, and the tanks accordingly exposed for a longer time to the fire of the antitank guns; terrain features could not be properly utilized; and, finally, modern antitank weapons can be laid and fired so rapidly that a zigzag course would not protect a tank against them.

SIGNAL CORPS BULLETIN

March-April 1936

(1) SOME THOUGHTS ON SIGNAL COMMUNICATION IN THE THEATRE OF OPERATIONS. Major General Allison

(2) DEVELOPMENT OF SIGNAL COMMUNICATION EQUIPMENT. Colonel Cowan

(3) SIGNAL COMMUNICATION. Major Matejka

(4) SIGNALS AT PINE CAMP. Major Rumbough

(5) THE MILITARY APTITUDE TEST. Captain Black

(6) POLICE DISPATCHING. Captain Teague

(7) A MOBILE TRANSMITTER FOR THE ULTRA-HIGH FREQUENCIES. Tinus and Bailey

(8) A STUDY OF TELEPHONE AND TELEGRAPH EQUIPMENT OF THE ARMY CORPS. Major Miller

WISSEN UND WEHR (Germany)

By Major G.J. Braun, Infantry

October 1935

(1) 125 JAHRE KRIEGSAKADEMIE. [125-year-old War College.] Lieut. Colonel Müller-Loebnitz

On the recommendation of General Scharnhorst and by order of King Frederick Wilhelm III, the General Military School was established 15 October 1810. This school later developed into the German War College. There have been numerous military schools that could trace their existence to the influence of Frederick the Great and his followers. Scharnhorst, as the first director of the War College, included the following subjects in his curriculum: leadership, strategy, tactics, military history, military geography, fortifications, artillery science, mathematics, and logic.

During the Napoleonic period (1806) the War College was closed by order of the French Emperor, and after reopening it had rather a hectic existence due to the differences in opinion between the military director and the study director. Clausewitz, the military director, after 12 years' duty at the school, was unable to greatly influence its teachings.

After 1860 the German War College made its greatest strides under the influence of Moltke and Schlieffen who were former students. Its standards became exceedingly high prior to the World War and its graduates so successful in the War that the Allies closed the school as one of its demilitarizing measures. This decision itself shows how highly it was regarded by Germany's enemies. The War College was reopened for its three-year courses again in 1935 by order of the present regime.

■ (2) GESCHICHTLICHE UND MILITÄRISCHE BETRACHTUNGEN ZUM DEUTSCH-ENGLISCHEN FLOTTEN-ABKOMMEN VON 1935. [Historical and military-political views of the German-British naval treaty of 1935.] Admiral Gladisch, Retired

Shortly after the conclusion of the German-British naval treaty, the Japanese news reporter, Kioski Kawakami, cabled the following report from New York to Tokio:

(a) This is the end of the Versailles Treaty.

(b) It is a severe blow to the League of Nations; England has neither asked the League nor even mentioned it during the conference.

(c) This pact nullifies the Washington and London Conferences.

(d) It will lead to the nullification of the agreements at Stresa.

(e) It will lead to the strengthening of the Franco-Soviet and Franco-Italian alliances.

(f) The German supremacy in the Baltic has caused considerable unrest in Russia which will favor Japanese politics in the Far East.

(g) This pact strengthens the Italian position against Abyssinia.

This message was well worded for repercussions have come to light in the meantime.

Will this be the end or the beginning of a historical development? Charges have been made that this is just the beginning, a forerunner to a request for the restoration of the German colonies. This has been denied. German official sources also state Germany has not the intentions, the need, nor the finances to engage in a naval race.

The German government recognizes the right to exist and England's right to domination of the sea to protect its empire; at the same time Germany is determined to insure her own existence and freedom on the continent. Germany intends to reestablish friendly relations with her English neighbors and prevent any recurrence of another war.

The author relates the historical incidents dating back to 1870 which gradually estranged England and Germany and led to the various coalitions of Europe and the race for sea supremacy prior to the War.

The German-British agreement contains the following important points:

(a) The future German fleet will be in ratio with the British as 35:100.

(b) This ratio is based on the tonnage permitted England by the London and Washington conferences, but should this tonnage be changed it will remain 35:100 to whatever the new British tonnage will be.

(c) This applies to all ship categories.

The submarine ratio is 45:100, but Germany has the right to build an equal number after a friendly consultation with England. The author presents the ratios of other foreign fleets for comparison with Germany's new ratio strength. He also touches on Admiral Fremantle's (British Navy) views of England's position regarding Italy and Abyssinia in which he states:

(a) The Italian strength in submarines and light warships in combination with Italy's strategical position can, despite the combined British and French navies, compel the well convoyed trade to cease.

(b) Malta should not be held as a naval base.

(c) The British trade in the Mediterranean Sea would disappear.

(d) England would be unable to maintain its protectorate over Egypt.

(e) The sea route to India and the Far East would have to be maintained around Africa.

The author, in his conclusions, feels that this new German-British pact is the first real step toward naval limitations and a preventive of a naval armament race.

(3) DIE AUFTEILUNG DEUTSCHLANDS—DAS KRIEGSZIEL DER ENTENTE. NACH RUSSISCHEN QUELLEN. [The dismemberment of Germany—the war objective of the Allies. From Russian sources.] Frantz

The author presents private letters written by Archduke Nikolai Michailowitsch to the Czar of Russia as proof of a plan to dismember Germany at the peace conference. These letters were written in 1916, after the Russian and Italian successes, when victory for the Allies was in sight. In these letters he requested that the Czar select him as one of the Russian delegates to this conference and that the other members should not be theorists nor politicians, but men without affiliations, without fear of press or slander—true far-seeing Russians.

In one of his letters dated 8 August 1916, he reminds the Czar that dismemberment of Germany is essential but that the press had only clamored for the dismemberment of Austria. This, he stated, was due to the influence of the Germans and Jews in Russia. He felt that Austria would naturally be dismembered by the Allies, with Hungary and Bohemia as independent states and that Galicia and parts of Bukowina would go to Russia, Transylvania to Rumania; the Serbs, Montenegrans, and Italians would take the rest, leaving the Duchy of Austria isolated and alone. He stated every effort must be made to also dismember Germany by giving Schleswig-Holstein to Denmark, Alsace-Lorraine to France, Luxemburg to Belgium, the area of the mouth of the Rhine to Holland, Posen to Poland, and a portion of Saxon Silesia and Bavaria to Austria. The fleet, he stated, must be reduced to the minimum and the country occupied by occupational troops of all the seven major allies until all reparations money was paid. He also desired the loss of colonies for Germany.

The author further comments on the background and nationality of the Archduke and his hatred of Germany, the Czarina and Archduke Nikolai Nikolajewitsch. He presents the letters written to Professor Schiemann on 31 July 1914—further evidence of his hatred of Germany. The author denounces the Grand Duke as a harbinger of discord.

(4) DIE SCHLACHT BEI TORGAU. ZUM 175. JAHRESTAG DER SCHLACHT AM 3. NOVEMBER. [The Battle of Torgau. At the 175th anniversary of the battle, 3 November.] Kessel

Frederick the Great, tired of the long campaigns which were so costly in men, munitions, etc., and whose battles were never decisive enough to eliminate that enemy, decided, in 1758, to resort to different strategy and force the initiative into the hands of the enemy and lure him to a location where a short decisive campaign could lead to a battle of annihilation. This location happened to be Torgau.

The author describes the events leading up to the battle and Daun's instructions from Maria Theresa of Austria that he be the aggressor and make the battle decisive. He describes the strong position taken by Daun, who relinquished the initiative the last moment and awaited the attack of Frederick who was numerically inferior. Due to separation of over one-third of his force in order to have a holding and an enveloping force and due to miscalculations during the enveloping detour, etc., Frederick attacked without having the initial support of his cavalry. He was actually defeated and forced to leave the field of battle because of the hopelessness of his position, the onset of darkness, and the failure of Zieten to attack from the south. When he finally heard Zieten going into the attack he returned to the battle and finally defeated the Austrians. His victory was not the battle of annihilation he had hoped for and his losses were too great to pursue and make the victory complete. It was Frederick's last great battle as he had lost faith in his commanders who were not entirely at fault in this battle. Frederick had taken long chances and gambled heavily for victory and failed to gain that which he sought—the decisive victory.

(5) EIN DOPPELTER DONAU-UBERGANG. [A double Danube crossing.] Strutz

This is an account of the double crossing of the Danube in the fall of 1915 by the IV Reserve Corps at Kostolac. The author describes the German attempt to force a crossing and their repulse by the Serbs. He describes the shortage of bridging and pontoon material. In spite of this shortage the Germans carefully planned a crossing on the morning of 8 October. Fog and mist favored the crossing, preventing hostile observation. A foothold was gained by the Bavarians and later a light pontoon bridge was thrown across. After very heavy fighting the Serbs were driven from the heights on the far side of the river. Before the artillery and transportation could cross, a torrential rain and wind storm occurred. The troops that had succeeded in crossing found themselves without rations, communications, and forage for the few animals on the far side. The river became swollen and the current so swift that movement of the boats became difficult; even the wounded were evacuated with great effort. The author states that not until 14 October did the storm abate and the situation begin to clear up. On 16 October the long-delayed river flotilla arrived and, due to high water, was able to function over the Serbian mines. The crossing was completed by the IV Corps on 26 October.

November 1935

(6) DIE WEHRPOLITISCHE LAGE DEUTSCHLANDS. [The military political situation of Germany.] Schwendemann

The author comments on the various political and military alliances of Germany's neighbors and their effect on her status. He states that the military situation within Germany has fundamentally improved and that Germany, since breaking the bonds of the Versailles treaty, has advanced from a third rate military power to a major power and soon will be the great world military factor of former days. He states that military politics in the world are changing. Politically, Germany is following the course of conservative isolation, keeping out of all foreign disputes and entanglements. This attitude has saved her much grief and its effect has been noticeable.

(7) DAS SOLDATISCHE FÜHRER. [The leader of men.] Lieut.Colonel Altrichter

This is an account of the fundamentals of leadership summed up as follows: responsibility for the morale, discipline, and military training of personnel. The commander must be well versed in his profession, kind and of excellent character. His life and conduct must serve as an example and inspiration to his men. He must gain their confidence and faith, must be firm and just. He must look after their needs and in times of stress shares their hardships and danger.

(8) FRANZÖSISCHE TANKVERLUSTE IM WELTKRIEG. [French tank casualties in the World War.] Lieutenant Ehrhardt, Retired

The author states the French constructed 3,177 light and medium tanks, between September 1917 and November 1918; of these 2,720 were issued to the army and 1,949 participated in the fighting.

The 1,949 tanks participated in 26 battles and skirmishes. It is rather difficult to arrive at conclusions as casualties incurred to tanks in battle because, for example, at Mery-Belloy on 11 June 1918, 162 tanks participated on a 5½ mile front and 73 were destroyed either by cannon fire or trench mortars. Again on 12-13 September 1918 at St. Mihiel, 151 tanks participated on a 4½ mile front and only one tank was hit by shell fire and two were destroyed by mines. The variation of tank casualties was probably due to influence of terrain, defensive measures of the defenders, and the fire-support. The width of the sector apparently did not influence the tank casualties. In all the engagements the French actually lost 748 tanks; of these 657 were destroyed by cannon fire, 16 destroyed by mines, 4 were destroyed by infantry machine-gun fire (and flames), and 71 were destroyed by unknown causes. French reports give the casualties to personnel as 303 killed, 1,459 wounded, and 251 missing.

From the foregoing data the cannon was the most dangerous weapon for the tanks. The mines became progressively more dangerous toward the end of the War. The destruction by infantry weapons were all due to lucky shots which was remedied toward the end of the War. Tank attacks

which were preceded by a systematic artillery preparation, received comparatively few tank losses; the reverse was true when artillery preparatory fire was missing. It is also of interest to note that only 13.7% of the Renault type tanks engaged were destroyed, in comparison to the medium weight Schneider and St. Chamond type which lost 30% of tanks engaged. This permits the conclusion that the smaller, well protected, faster, and more mobile type was better suited for the purpose.

(9) FAHRBARMACHUNG VON KAMPFWAGEN FÜR STRATEGISCHE VERSCHIEBUNGEN. [Preparation of tanks for strategic transfers.] Captain Rothardt

The fundamental principle in strategic transfers of tanks from one theater of operations to another is speed on roads. To gain this speed they must be transported on wheeled vehicles. Recent tests have been made in utilizing under-slung trailer carriages but propelling them by converted power from the tank itself. This shortened columns on the road 50% and converted these track-laying tanks into a street-fighting armored car. Some of the other advantages of this method are:

(a) Inexpensiveness of equipment.

(b) Availability of quantity production (which is only possible since the motor of the tank provides the propelling power).

(c) The weight of the motorless carriage is less than that of a truck plus tank.

(d) Requires less personnel (truck driver and assistant).

(e) Protection of crew against effect from hostile fire (machine gun, air attack, etc.) as the vehicle can be operated from within the loaded tank.

(f) Whenever difficult terrain is encountered the tank can detruck and serve as a tractor to haul the carriage over, then entruck and move on.

This type of carraige was first used in Poland and called the motorless carriage for self-propulsion by tanks.

Similarly, flat cars are so constructed to carry tanks that the tank can provide the propulsion power. In addition to transportation possibilties, the tank mounted on the flat car can serve to patrol stretches of railroad lines, can cooperate with armored trains, and assist in a breakthrough in a railroad district. Various combinations of utilizing flat cars are feasible.

It is hoped that further developments may devise means of rapidly moving heavy tanks over great distances on carriages operated by their own power plants.

December 1935

(10) MILITÄRISCHE PROBLEME UM ABESSINIEN. [Military problems in Ethiopia.] Colonel v.Xylander, Retired

The author discusses at length the political and military background of the Italian-Ethiopian dispute. He states that due to the vast number of troops and the modern equipment used by Italy, the war does not assume the status of colonial pacification but that of a major war. He describes the mobilization and preparedness of the Italian expedition; the construction of roads and facilities in Eritrea for the campaign and the various difficulties encountered both in the northern and southern fronts as to water, supplies, roads, terrain, etc. He also discusses the problems of the Italian leaders and some of their experiences.

(11) ZUR FRAGE DER SCHWERPUNKTBILDUNG IM MEHRFRONTENKRIEGE. [The selection of the decisive front where several theaters of operations are involved.] Lieut.Colonel Lindemann

This article describes Germany's problems in a war on more than one front, citing the Seven Years' War when Frederick the Great fought enemies on several fronts, and the late World War. Fortunately, during the Napoleonic Wars and in 1866 Germany was allied with other nations and in 1870 the diplomacy of Bismarck denied France any allies and permitted Germany to fight a one front war. The author comments on the problems which determine the area in which the center of mass should be located in different phases of a multiple front war based on the strategical intentions and necessities at that particular time.

The author ably sums up his article when he states, "of major importance was the decision in France, and of secondary importance the occupation of East and West Prussia in 1914, but the situation was reversed in the spring of 1915 when the occupied terrain of Northern France became secondary and the decisive defeat of Russia became the major effort."

Section 5

Academic Notes

THE COMMAND AND GENERAL STAFF SCHOOL

REPRINT OF CURRENT SCHOOL MATERIAL, WHICH AFFECTS INSTRUCTIONAL PROCEDURE OR TACTICAL DOCTRINES

Instructional Organization

Commandant
MAJOR GENERAL H.J. BREES

Assistant Commandant
COLONEL W. B. BURTT

Secretary
LIEUTENANT COLONEL W. R. NICHOLS

Directors

Second-Year Class.....COLONEL W.B. BURTT (Acting)
One-Year Class.....COLONEL J. A. MCANDREW
Special Class and Extension Course....COLONEL R. TALBOT, Jr.

Chiefs of Sections

I. Offense.....LIEUTENANT COLONEL J. E. SLOAN
II. Intelligence and Special Operations.....LIEUTENANT COLONEL J. H. HOOD
III. Defense and Security.....LIEUTENANT COLONEL W.M. GRIMES
IV. Supply and Administration.....LIEUTENANT COLONEL T. LAWRENCE
V. Publications.....LIEUTENANT COLONEL E. B. WALKER

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STAFF LIAISON OFFICERS

[24 February 1936]

1. It is a fundamental principle that commanders of all units furnish and transmit promptly any pertinent information which is of value to higher, lower, or neighboring units. This is particularly important as regards information from subordinate units to the next higher units as the preparation of orders depends on receipt of correct information.

2. In practice this is frequently neglected due to carelessness, forgetfulness, stress of combat, or failure of signal communications. In war, experience teaches that the information, even under favorable conditions, that comes in to the higher headquarters is always slow, incomplete, and frequently contradictory.

3. This is due to many reasons. In the beginning of any campaign, unsuccessful local or general operations may produce a state of physical and moral depression accompanied by physical fatigue which intensifies tendencies to criticize and raise objections to orders received. This, in turn, may produce a hesitating and timorous state of mind in the commander which in turn will affect his staff and troops. Reports from commanders when such conditions exist never represent the true conditions of their units or the true execution of their orders.

4. Planning by higher headquarters based on such reports must of necessity be in error. Therefore to plan intelligently a higher headquarters must take the necessary steps to know the actual condition of affairs and the actual results obtained in the execution of their orders.

5. Experience has taught that this can best be obtained by the employment of vertical liaison. This consists in dispatching experienced liaison officers to subordinate units to observe execution of orders and report from time to time personally to their headquarters the results of their observations. This frequently may best be done at the conclusion of each day's operations.

6. This system of vertical liaison, however, is not without its defects. It has a tendency to subject a subordinate commander to a certain intimate supervision by a junior officer. These liaison officers frequently incur the cordial dislike of their brother officers of the line. In the French Army they received the collective soubriquet of "Young Turks." Singly and collectively they frequently become targets for political sniping at the hands of those not bold enough to try conclusions with their chief. However, irrespective of the conditions under which liaison officers operate, the merits of the vertical liaison system will always outweigh its defects. This is particularly true during the opening months of a campaign.

7. For the reason that its importance is very real, vertical and horizontal liaison will be emphasized in the teaching at this school. During corps map exercises a brief period of time in each exercise will be devoted to troop leading of the liaison officers.

8. The duties which liaison officers are called upon to perform and the manner in which they should function are contained in the following extract from the pamphlet, *Command and Staff Liaison*, 1936:

* * * * * * *

2. PURPOSE OF COMMAND AND STAFF LIAISON.—*a*. The primary purpose of command and staff liaison is to enable the commander to keep in intimate touch with the tactical situation and the problems of higher, lower, and adjoining tactical units.

b. Command and staff liaison has a twofold purpose: (1) to permit the commander to keep up to date on the situation of his units, and to give him elements of information on which he can base his decisions; (2)

to insure between the various echelons of command, between adjacent units, and between the different arms of the service, the transmittal of all communications that are necessary to accomplish a concerted effort.

3. NECESSITY FOR LIAISON OFFICERS.—*a.* It is manifestly impossible for a commander of units the size of a division or larger to maintain personal contact at all times with the tactical units of his command, and with neighboring tactical units.

b. While it is fundamental that units must promptly transmit any pertinent information which is of value to higher, lower, or neighboring units, nevertheless in practice this is often neglected due to carelessness, forgetfulness, stress of combat, or failure of signal communications. Therefore, a commander must make use of liaison officers.

4. DESIRABLE ATTRIBUTES OF LIAISON OFFICERS.—*a.* In order to inspire confidence and insure mutual understanding, it is of primary importance that an officer detailed on a command and staff liaison mission should be favorably known, either by personal acquaintance or by reputation, to the commander to whom he is sent.

b. For the performance of the delicate work of command and staff liaison, he should possess such essential qualities as:

(1) Good judgment.
(2) Unfailing tact.
(3) Initiative.
(4) Sympathy, which implies a desire to help rather than to criticise.
(5) Acute perception, coupled with exactness and accuracy in determining facts.
(6) Ability to express himself and deliver impartial reports in the clearest and most concise terms.
(7) Good tactical knowledge.

5. UNITS TO WHICH LIAISON OFFICERS ARE SENT.—*a.* Normally, liaison officers are sent from higher to lower echelons, from lower to higher echelons, and from one unit to another on either flank. This may be described as vertical liaison and lateral liaison.

b. Thus a corps, for example, may send a liaison officer to army headquarters, to each of the divisions of the corps, and to the corps flanking it on its right and left.

c. Because of the shortage of officer personnel available for liaison missions, a division does not always send liaison officers to its brigades. On a march in which contact with the enemy is not expected, the division will not usually have liaison officers with brigades. However, during combat this is considered necessary and at such times suitable officers will be selected from the troops, preferably from the division reserve or rear elements, if division staff officers are not available.

6. PRELIMINARY ARRANGEMENTS.—*a.* The mission of the liaison officer, is the determining factor in the manner he should approach the unit to which he is sent. If he goes either as an ordinary staff officer to be of service to the unit to which he is assigned, and to keep his own headquarters informed as to the status of this unit, or as the bearer of instructional matter from his headquarters, then a simple explanatory letter signed by his own chief of staff is all that is necessary. This letter he will, of course, present when reporting.

b. In the case where his mission is of a confidential or highly important nature, for example one which authorizes him to act in the name of his own commander, his commander should make a personal visit to the commander of the unit to which the liaison officer is assigned and explain what he expects the latter to accomplish. If a personal visit is impracticable, the commander should send a personal letter to the unit to which the liaison officer is assigned, setting forth what he expects this officer to do and how he desires him to operate.

7. DUTIES AND INSTRUCTIONS.—*a.* A liaison officer may be called upon to perform one or more of the following tasks:

(1) He may be sent to interpret a particular order for the commander.

(2) He may be sent to gain certain information, with orders to report back immediately after this information has been obtained.

(3) He may be sent as the commander's agent to transmit a definite order.

(4) He may be ordered to remain with a unit throughout an engagement. In this case he should promptly notify the commander, whose agent he is, when the critical moment in the battle occurs so far as the unit is concerned. Naturally, such information should be anticipated, if possible, so that his commander will have sufficient time in which to act upon it. Liaison officers transmit all pertinent information concerning the situation of the unit, including information of the enemy.

(5) He may be instructed to act in the name of his commander, being given several plans by his commander and authorized to use his own judgment, as to which plan shall be adopted by the unit to which he is reporting, after he has arrived at the unit and has acquainted himself with the situation. Such mission should be the exception, however, and should only be given when a great emergency prevents the commander from acting in person. When it becomes necessary for a liaison officer to issue an order in the name of the commander, responsibility for such an order remains with the commander even though he may not have seen the order as actually written or heard it as actually issued if given orally.

b. In any event, before leaving on a liaison assignment, the officer must be given a clear-cut mission, or definite instructions, which should be in writing, and he should be thoroughly conversant with his commander's ideas in order to answer intelligently the various questions which naturally will come up. This, if carefully and thoughtfully carried out by the commander who assigns the liaison officer, should clear up most of the misunderstandings that otherwise might arise between the two units, and thereby materially aid the success of the mission.

c. Often while on a liaison mission, the initial situation will change. Conversant with the commander's thought, the liaison officer must, if the occasion arises, change the literal text of the instructions under which he is operating or of which he is the bearer. His mission also may be to observe the execution of prescribed movements, and this may require him to get well-forward with front-line units. It is essential that in rendering his reports, his estimate of the situation should be so reliable as to serve as a basis for his commander in forming new decisions.

8. PERSONNEL AND EQUIPMENT.—*a.* It is unlikely that any extensive detail will be assigned to accompany a liaison officer. However, he should have a staff car for his personal use, and should be accompanied by not less than two men for messenger service, each of whom should be assigned a motorcycle. These men should be alert, and be gifted with initiative, good judgment, and the ability to read maps easily.

b. A plentiful supply of road maps, and large scale maps covering the area of operations, should be given the liaison officer.

c. For the transmission of messages, the liaison officer will have to depend on the use of the signal communications net of the headquarters to which he is assigned.

9. ACTIONS ON ARRIVAL AT THE HEADQUARTERS TO WHICH ASSIGNED.—*a.* On arrival at the headquarters of the unit to which he is assigned, the liaison officer should report immediately to the commanding officer, or to the chief of staff, and present the credentials, orders, or instructions under which he is operating.

b. He should then establish close and friendly relationship with the staff. In order to effect this, he should arrive at the headquarters well before the beginning of an operation. The longer the period of time he is with a unit prior to actual combat, the more opportunity he will be afforded to establish himself on such a footing.

c. He should study ways and means of transmitting information to his own headquarters. If he plans to send messengers or to go in person, he should study the best route and alternative routes, bearing in mind that bad traffic jams or heavy enemy shelling may forbid the use of certain

roads. If messages are to be routed by telephone, telegraph, radio and, in an emergency, by airplane, he should make definite arrangements with the headquarters to which he is assigned for the use of such facilities. He should constantly bear in mind that the quickest delivery of a message is the aim sought.

d. He should make reconnaissance, in such detail as time and other conditions will allow, of the zone or sector in which the unit is operating.

e. Since they are strictly preparatory measures, the factors, covered in subparagraphs *a*, *b*, *c*, and *d* above, should all be settled before the actual stress of combat begins.

f. The liaison officer should send plotted situation maps, and should render concise, graphic, and accurate reports, to his own headquarters. As previously stated, this is actually the responsibility of the headquarters of the unit to which the liaison officer is assigned but, due to carelessness, neglect, forgetfulness, or stress of combat, there is often a failure on the part of the staff to do this.

g. By a frank and honest attitude, the liaison officer should convince the unit to which he is assigned that his one and only purpose is to help, not to criticise. He should keep the unit advised of the contents of all messages which he sends to his own headquarters.

h. He should make it a point to get information of probable orders or instructions to be issued in the future, and should transmit their import to his own headquarters.

i. Finally he should familiarize himself with the thought, aims, and spirit of the unit with which he is working, and bend every effort to inspire confidence in his ability and honesty in the commander and staff, so that when the crisis comes they will turn to him for help rather than avoid him.

10. COOPERATION OF THE HEADQUARTERS TO WHICH THE LIAISON OFFICER IS ASSIGNED.—*a.* Without the full and hearty cooperation of the unit to which he is assigned, the task of the liaison officer is almost certainly doomed to failure. A corps commander in the AEF stated:

> "When the commander of a division, or a corps, on a flank shunted off the liaison officer I was maintaining at his headquarters and allowed him to know only what was locally desired, I took early opportunity to recall such liaison officer."

b. Free access to the operations (G-3) section should be allowed him, for it is only by being present at the preparation of such plans that he can obtain their full import and most clearly understand the intentions of the commander.

11. DIFFICULTIES TO BE EXPECTED ON COMMAND AND STAFF LIAISON DUTY.—*a.* The task of a liaison officer is difficult and trying at best, and the essential qualities of good judgment and strong character are indispensable to his success, particularly in open warfare situations where events move with such amazing and confusing rapidity.

b. An interesting view of some of the disagreeable features of liaison duty is given by Major Laure, who was in the office of the Assistant Chief of Staff, G-3, at French GHQ, and who often acted as liaison officer. On 15 July, 1918, Major Laure was sent by his chief of section, General de Barescut, to Sézanne with the mission of learning the plans of General Maistre who was in command of the Group of Armies of the Center. Major Laure obtained all the available information and returned with it to General de Barescut. Major Laure was sent to the same headquarters on the next day, 16 July, and again on the 17th. He writes:

> "For the third time, General Maistre received me with the same friendliness; but the Chief of Staff seeing me settle down *without any clearly defined mission* in the office where he was working with General Maistre, and being worn out after two hard days, became thoroughly vexed. He asked me why I had come back, as if I could help it. I defended myself vigorously, and explained to him that General de Barescut liked, at such critical moments, to have a liaison agent observing the reactions and getting the decisions and other information from the headquarters which was working out the plans. The Chief of Staff objected vehemently saying, 'I won't hide from you the fact that you keep me from working and I'd much rather see you

somewhere else.' I saluted respectfully, said good bye to General Maistre, who didn't detain me, and to the Chief of Staff who congratulated me on my departure. In the next room I told my troubles to Colonel Dessoffy (G-3) who gave me his condolences, touched with a bit of irony, and I returned to GHQ at Provins as quickly as possible.

"A little incident in such great hours! But it is interesting. I felt that I did not lack tact, nor had I violated the rule of keeping quiet, but I was, by my very presence, in the way, though I had tried to act as modestly as possible. General de Barescut did not send me back a fourth time."

c. One more experience of Major Laure is worth quoting:

"The 8th of August, 1918, the command and staff agencies of the First French Army were carefully isolated and safeguarded against the indiscreet. Even (or perhaps especially) the liaison agents of higher echelons were shunted off to a barracks in the middle of the school yard near the G-3 office. I was with Captain Seroy who was representing Marshal Foch. Major Godfrey, one of our old comrades at GHQ, had written in great big letters on the door of the First Army G-3 office: 'Entry forbidden to every officer not belonging to the First Army Staff.' That was a bit hard on us, because we had the mission of keeping the high command informed, and we couldn't very well do it *without sitting in with the Army G-3*. We had to be content with the little we could get hold of and we telephoned from hour to hour whatever information Godfrey passed out to us through his officers."

ANTIAIRCRAFT DEFENSE OF FIELD FORCES

[20 March 1936]

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1. THE AIR THREAT.—Certain students of military aviation are of the opinion that in the war of the future combat aviation will operate habitually under General Headquarters and that observation aviation alone will operate as part of an army, an independent corps, or an independent division.

And there are those who develop their concept of air operations to the point of declaring that combat aviation will chiefly comprise bombardment units which will be employed solely for attacking large centers of population and of industry; this with a view to breaking the will-to-fight of the people of the opposing nation.

The proponents of this doctrine hold that the land and naval forces will play little part in a modern war and that the decision will be gained alone through the medium of air operations against the hostile homeland.

If, however, we examine the records of the final months of the World War and such military operations as have been conducted since 1918, we find no evidence to warrant the assumption that combat aviation will not be employed against troops and supply establishments in the theater

of operations. In fact, we find the Germans in their offensive of March, 1918, concentrating the efforts of their combat aviation against the forward British defensive elements with the purpose of forwarding the advance of their attack divisions.

Most certainly it would appear that any tactical doctrine, which assumed that field forces would not be subjected to air attack and which failed to provide for the defense of the ground elements of field forces against the operations of hostile aviation, would be fraught with danger.

2. THE AERIAL FRONT.—The introduction of mechanized units has greatly increased the extent of the terrestrial front by necessitating the provision of an all-around defense to meet mechanized attacks. The development of aviation has added an aerial front to the terrestrial front and in any operation against troops of a first class power a commander of an independent force will be concerned with the establishment of an effective defense on this new front. It is with this problem of the commander of a field force that this paper is concerned.

3. ANTIAIRCRAFT DEFENSE MEASURES.—It should be accepted as fundamental that the commander of every element of a command is responsible for the antiaircraft defense of that element to a degree commensurate with the means available to him for effecting that defense. Measures for effecting antiaircraft defense may be classified as passive or active.

4. PASSIVE DEFENSE MEASURES.—*a. Concealment* from air observation forms the basis of an effective passive defense against both observation and combat aviation. This may necessitate that marches be made habitually at night without lights and in many columns. It suggests the desirability of locating service trains in villages and towns and the use of wooded areas for the bivouac and assembly areas of combat units. Camouflage will be employed to afford concealment to artillery in firing positions, ammunition dumps, and other installations of a similar character. The use of dummy installations will assist in effecting a passive defense.

b. Dispersion of troops and installations will make the problem of hostile observation aviation more difficult and will offer fewer suitable targets to hostile combat aviation. This will necessitate the employment of extended distances and intervals between marching columns. When conditions demand that daylight marches be conducted, the need for dispersion may result in marches being made across country in company or even smaller columns. The dispersion of troops in bivouac and in assembly positions and the dispersion of supply establishments should prove an effective means for providing a passive defense against combat aviation. However in areas where the terrain is highly favorable for hostile mechanized attacks a great dispersion of supply establishments may prove undesirable. Consideration of the question of anti-mechanized defense may indicate the desirability of placing the bulk of the supply establishments in one area. Such an area should be selected, and supply installations located therein, with a view to facilitating the establishment of an area defense by antiaircraft artillery.

c. The employment of balloon barrages (barriers) proved very effective in the defense of London. Such barrages will probably not lend themselves so well to rapidly moving situations in the field.

However in more stabilized situations and during marches through lengthy defiles the employment at night of balloon barrages to block prominent avenues of approach or the location of such barrages in coordination with planned antiaircraft artillery fires may prove effective.

d. While camouflage troops do not form an organic part of commands smaller than an army it is believed that in these smaller commands passive defense against aviation can be improved by the employment of the engineer services in the supply of camouflage material, in instruction in principles of camouflage, and in the supervision of its construction.

e. The marking of ambulances, hospitals, and other establishments of the medical service should be made with a view to their being easily distinguished from the air. Such establishments should as far as is practicable be well separated from installations likely to be made the objects of air attack.

f. It is imperative that the plan of antiaircraft defense provides for the employment of the air service to test, by air observation and air photography, the effectiveness of the means adopted to secure concealment and dispersion throughout the command.

5. ACTIVE DEFENSE AGAINST LOW-FLYING AVIATION.—*a.* With our present organization the brigade and the division, except when reinforced by antiaircraft artillery or combat aviation, have no means of defending themselves with fire against high-flying (over 4,000 feet) aviation. However, the automatic weapons and rifles of these organizations should, when effectively employed, afford a considerable defense against low-flying aviation.

b. The antiaircraft machine guns of the field artillery brigade may well be used in many situations to form the basic elements for a coordinated employment of small-arms fire that will provide an area defense for the bulk of the division. When the speed of the airplane is considered, the effective employment of these fires presupposes that a considerable number of machine guns be constantly sited for antiaircraft fire and that an alarm system be provided which will permit the rapid execution of antiaircraft defense measures.

c. In the corps and army the weapons of the machine-gun battalions of the antiaircraft artillery provide a means for counterattacking low-flying observation and attack aviation. These will be employed to protect vulnerable points such as command posts and supply establishments of the corps and army. They will also be employed to reinforce the defensive fires of the divisions. This reinforcement will ordinarily be accomplished by the attachment to divisions of antiaircraft artillery machine-gun units.

d. Corps and army troops should likewise employ their automatic weapons in supplementing the machine-gun fires of antiaircraft artillery units.

e. The antiaircraft artillery units of line of communication troops will at times be employed wholly or in part in the protection of convoys of service trains. However, the bivouacs of these trains should be selected with respect to supply establishments so that an area defense for both service trains and supply establishments can be provided while trains are in bivouac.

f. When practicable, the antitank machine guns of divisions and of line of communication troops should be sited for antiaircraft fire.

g. The assignment of antiaircraft artillery officers as liaison officers to divisions and corps troops should prove of great assistance to the commanders of these echelons in establishing an effective antiaircraft defense.

6. ACTIVE DEFENSE AGAINST HIGH-FLYING AVIATION.—*a.* Unless pursuit aviation is attached to an independent corps or to an army these units have not the means to oppose by air attack the operations of high-flying aviation. However, the commanders of the corps and of the army have at their disposal means for providing antiaircraft protection against high-flying aviation in their organic antiaircraft artillery gun battalions.

b. The *attainment of surprise*, that element which has so often proved the most important essential to the success of a military operation, will prove more and more difficult as means to effect observation from high altitudes are improved. In determining on a plan for the employment of his antiaircraft guns a commander will therefore be faced with the problem of weighing the relative threat to the accomplishment of his mission that will be afforded by high-flying combat aviation as compared to that afforded by high-flying observation aviation. On this decision largely will rest his plan for the distribution of his antiaircraft artillery gun units, to protect reserves and other combat elements from air observation and to protect sensitive points in his line of communications from attack by high flying combat aviation.

c. In some situations, in order to *attain surprise*, the commander may prescribe that the antiaircraft fires of troops in concealed bivouacs be withheld against both low-flying and high-flying aviation except when the troops are actually subjected to air attack.

7. ANTIAIRCRAFT INTELLIGENCE.—*a.* As stated in paragraph 3 above, the adoption of proper measures for antiaircraft defense is the responsi-

bility of commanders of all echelons. Therefore, it is highly essential that there be disseminated throughout the command a knowledge of the general characteristics of hostile airplanes and a general picture of the tactics enemy aviation is most likely to employ.

b. Furthermore, if prearranged antiaircraft defense measures are to be taken to resist air attacks, an alarm system must be provided to give warning to troops of the approach of hostile aviation. Since this warning must be timely, antiaircraft defense plans should provide for the prompt receipt of pertinent information from other theaters of operations and from the General Headquarters Air Service. In addition, the command must provide its own system of antiaircraft observation.

c. The antiaircraft artillery intelligence service with its observation net comprises an organization for providing antiaircraft intelligence to the command. The signal service will probably have to lend considerable assistance in order to tie in the observation net of the AAIS with the antiaircraft alarm systems of units other than those of the antiaircraft artillery.

8. PURSUIT AVIATION.—*a.* During the World War in the defense of London, antiaircraft guns were effectively used to break up German bombardment formations and thus assist the defensive fighter squadrons to attack under favorable conditions. Antiaircraft searchlights were also used to assist night fighter squadrons. So effective did this employment prove that in 1918 similar use was made of antiaircraft artillery to assist fighter squadrons on the Western Front.

b. During field operations, General Headquarters may attach pursuit aviation to an army or an independent corps or General Headquarters may place pursuit aviation at the disposal of an army or an independent corps for a specified period. At other times pursuit aviation may be ordered to support the field forces under General Headquarters control. In any of these cases, it is possible that the friendly planes may attack enemy air formations within range of the guns and the searchlights of the antiaircraft artillery. In such an event rapid communication between pursuit aviation and the antiaircraft artillery gun battalions should be provided in order that the efforts of the two arms may be coordinated. In more stabilized situations this coordination may be further secured by establishing gun defense areas and air defense areas.

c. The antiaircraft artillery may at times render effective assistance to pursuit aviation by indicating with shell bursts the direction from which hostile aviation is approaching, by illuminating hostile formations with searchlights, and by breaking up hostile formations with gun fire.

d. The successful coordination of these measures will require the closest liaison between the antiaircraft artillery, aviation, and the signal service.

9. PROTECTION OF AVIATION FROM FRIENDLY GROUND FIRES.—*a.* Regardless of the intelligence measures taken to warn troops of impending attacks, the speed of airplanes is so great that attacks, from the viewpoint of ground troops, will come with great suddenness. Under such conditions our air service and friendly combat aviation operating in the theater will probably be subjected to our own ground fires unless positive steps are taken to correct this defect.

b. Such steps will probably include provisions for the employment of routes for friendly aviation that will avoid the gun fire areas of our antiaircraft artillery. The employment of such routes will also serve the purpose of positively identifying as hostile any air formations not following the prescribed routes. Planes should be marked and identification signals from air to ground provided for. In addition, means should be provided to warn the ground elements, particularly the antiaircraft artillery, of impending friendly air operations within range of our ground fires.

c. This will necessitate a rapid means of communication between our aviation and the antiaircraft artillery intelligence service and will also involve the cooperation of our signal service.

10. COORDINATION OF ANTIAIRCRAFT DEFENSE MEASURES.—*a.* From the foregoing paragraphs we note that the means available to the commander in the theater of operations for effective antiaircraft defense involve the employment of cover and dispersion by all elements of his command. We note also that he has the opportunity of employing the fires of the

automatic weapons and rifles of his subordinate units, when the situation will permit, and of his antiaircraft artillery units.

b. It seems reasonable to assume that the command which has been indoctrinated with a sound and uniform scheme of passive defense measures and whose antiaircraft defense plan provides for the coordination of its antiaircraft fires should prove far less vulnerable to air observation and air attack than does one which has not adopted such measures.

c. In 1918 on the Western Front we find the British Third Army and the corps of that army announcing most detailed instructions to its divisions relative to antiaircraft defense measures. Instructions as to what establishments would be charged to divisions for antiaircraft defense, directions to divisions to have one gun in each battery of field artillery prepared to fire an antiaircraft barrage, directions for supports and reserves to fire on enemy aircraft while front-line troops reserved fire for the hostile infantry all appeared in these orders which were quite explicit in explaining to subordinate units the probable tactics of the opposing aviation.

d. In our service today the subject of antiaircraft defense is covered in various training manuals and in a well trained organization instruction in antiaircraft defense will be included down through the school of the soldier. In such an organization the plan of antiaircraft defense may be covered in a brief paragraph of the field order assigning tasks to the antiaircraft artillery. With untrained troops or in the event of a somewhat stabilized defensive situation where extensive hostile air attacks are to be expected the higher command may go into such detail as to require an annex to the field order in order to provide adequately for antiaircraft defense during an operation.

e. Regardless of the detail in which the subject of antiaircraft defense is covered in field orders, a thorough understanding on the part of the commanders of all echelons of their responsibilities in antiaircraft defense is essential if that defense is to prove effective.

11. CONCLUSIONS.—*a.* In field operations of the future the effectiveness of antiaircraft defense will be measured by the ability of the commander to employ all the defensive means at his disposal in a coordinated manner.

b. These means comprise in addition to passive measures the automatic weapons and rifles of combat and service troops and may include antiaircraft artillery and combat aviation.

c. Aviation, the antiaircraft artillery, the signal service, and the engineer service comprise the special arms and services that can render the greatest assistance to the commander in effecting antiaircraft defense.

SUPPLEMENT

The Principles of Strategy

The War Plans Division of the General Staff has the responsibility for initiating and developing all war plans as well as the basic part of the army strategic plan. At the outbreak of war changes in the military situation may occur with startling rapidity which may bring corresponding changes in the plans prepared in time of peace. During the progress of war, new strategic conditions will constantly confront independent and semi-independent commanders in the field, calling for decisions which must be made quickly and without the careful analysis and preparation given to peace-time planning.

The pamphlet, "The Principles of Strategy for an Independent Corps or Army in a Theater of Operations" has for its main purpose the presentation of principles which should guide the commander of an independent force of the size of a corps or an army in making the proper strategic decisions. *(Editor)*

Section 6

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Key to Abbreviations

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A Ord—Army Ordnance

A Quar—Army Quarterly (Great Britain)

Bul Belge Mil—Bulletin Belge des Sciences Militaires (Belgium)

Can Def Quar—Canadian Defence Quarterly (Canada)

Cav Jour—Cavalry Journal

Cav Jour [GB]—Cavalry Journal (Great Britain)

CA Jour—Coast Artillery Journal

FA Jour—Field Artillery Journal

Ftg Forc—Fighting Forces (Great Britain)

Inf Jour—Infantry Journal

Jour RAMC—Journal of the Royal Army Medical Corps (Great Britain)

Jour R Art—Journal Royal Artillery (Great Britain)

Jour RUSI—Journal of the Royal United Service Institution (Great Britain)

Jour USII—Journal of the United Service Institution of India (Great Britain—India)

MC Gaz—Marine Corps Gazette

Mil Mitt—Militärwissenschaftliche Mitteilungen (Austria)

Mil-Woch—Militär-Wochenblatt (Germany)

Mil Eng—Military Engineer

Mil Surg—Military Surgeon

Nav Inst Proc—Naval Institute Proceedings

Pion—Pioniere (Germany)

QM Rev—Quartermaster Review

Rev Ej Mar—Revista del Ejercito y de la Marina (Mexico)

Rv l'Air—Revue de l'Armée de l'Air (France)

Rv d'Art—Revue d'Artillerie (France)

Rv de Cav—Revue de Cavalerie (France)

Rv d'Inf—Revue d'Infanterie (France)

Rv Gen Mil—Revue du Génie Militaire (France)

Rv Mil Fran—Revue Militaire Francaise (France)

Rv Mil Suisse—Revue Militaire Suisse (Switzerland)

Riv Art e Gen—Rivista di Artiglieria e Genio (Italy)

RAF Quar—Royal Air Force Quarterly (Great Britain)

Roy Eng Jour—Royal Engineers Journal (Great Britain)

Sanct Chris—Sanct Christophorus (Germany)

SC Bul—Signal Corps Bulletin

Ws & Wr—Wissen und Wehr (Germany)

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